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AMERICAN BEE JOURNAL

OCTOBER

1924



A SPLENDID APIARY IN COLORADO, ONE OF THE SORT WE WOULD ALL LIKE TO HAVE

BEEES ON EAST SLOPE OF ROCKIES—F. C. Pellett.

HONEY AS AN ANTI-FREEZE—Russell H. Kelty.

SENSE OF SMELL IN HONEYBEE—J. H. Lovell

HOW STORES FEATURE HONEY—Wallace Piper.



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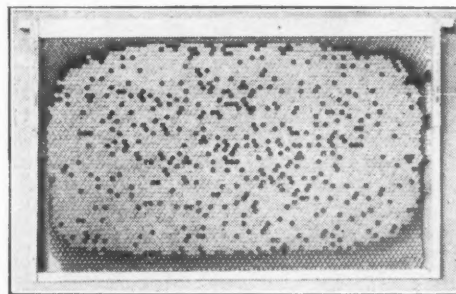
Manley's apiary, sizeable, well kept, hustling.

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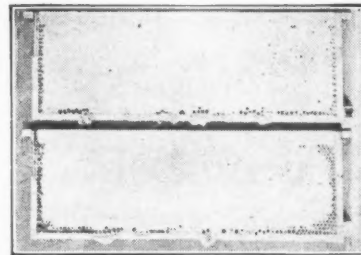
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The Diamond Match Co.'s Factories and Yards at Chico, Calif., cover 220 acres.

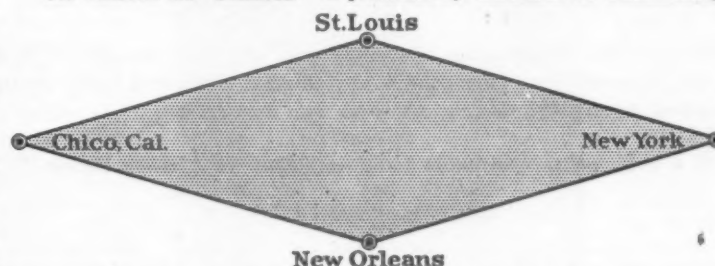
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NOW READY— Forty Honey Marketing Plans

AS a climax to our Fiftieth Anniversary we have published in book form forty plans and honey marketing ideas which came to us as a result of our honey marketing contest.

This book is the result of the time and thought of 40 beekeepers who successfully sell their honey crops.

In compiling this honey marketing information we are indebted to the suggestions given by the contest judges, Carroll Dean Murphy, advertising agent; Ezra Warner, President of the Sprague, Warner & Company and E. T. Meredith, former Secretary of Agriculture.

We agree with their conclusions that two features are paramount to market honey successfully:

1. The absolute protection of the customer by maintenance of quality.
2. Selling through channels of distribution that afford protection to the consumer.

Future thought about marketing of honey should certainly consider (a) centralized and stabilized supply, (b) guaranteed quality, (c) financing the education of the public, (d) meeting competition based on cut prices and inferior grades.

Our little contest was only a beginning in the solution of this important problem. There is nothing to prevent the successful marketing of honey when it is wanted badly enough to receive the time, thought and money necessary. Let us all work together on it.

Write today for a copy of this valuable book on "How to Market Honey." Free as long as supply lasts.



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AMERICAN BEE JOURNAL

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HAMILTON, ILLINOIS

OCTOBER 1924

BEES ON THE EAST SLOPE OF THE ROCKIES

By Frank C. Pellett.

GREAT changes have taken place among Colorado beekeepers since my first visit to that state ten years ago. Some of the older beemen have died, some have moved to other locations and some have given up the business. The greatest changes, however, seem to be in the methods followed by the beekeepers still operating in that region. Some of the changes are due to the general upturn of human affairs caused by the war, some to changes in local conditions as a result of the development of the country, and others to a change in sentiment among the beekeepers.

At the time of my first visit the eight-frame hive was almost universally used and comb honey was produced almost exclusively among the active beekeepers of the region. No winter protection was thought to be necessary, because of the frequent flights possible to the bees in the higher altitudes. Now many are advocating big hives and winter protection, and the men who produce extracted honey are in the majority.

My first big surprise was when I visited Herman Rauchfuss, one of the most extensive producers of Colorado and found him producing chunk and extracted honey entirely. At the time when I last visited him he was running 1,800 colonies for comb honey and producing a fancy product. He explained that he was unable to continue the production of comb honey during the difficult period of readjustment, when supplies were high and honey was low. He accordingly removed the section holders from his comb honey sections and improvised a cheap frame to fit the same super. In this he placed thin super foundation and proceeded to produce chunk honey, which he has since marketed through the Colorado Honey Producers as "Cut-Comb" honey. "Cut-Comb" is a trade name for his particular output and that of others marketing through the Association, and is a protected trade mark. The cut-comb honey is proving popular in the market and the output of the Rauchfuss apiaries is disposed of without difficulty. The honey is cut from the

This is the first of a series of articles by the associate editor giving his personal impressions of beekeeping conditions in Colorado and Utah. The next will deal with the western slope of the Rockies.

frames and placed in pails and the remaining space filled with extracted honey. The picture shows a machine which Mr. Rauchfuss devised for putting foundation into the frames. It is built after the general plan of the Rauchfuss foundation fastener which is so successful for putting foundation in sections.

Herman Rauchfuss is widely known as a successful honey producer, but he has decided to take things a little easier and has sold most of his 3,000 colonies of bees to his four boys, reserving only one



Bert Hopper, one of the big beemen of Colorado.

yard where he occupies himself with developing a superior strain of Caucasian bees. He has been breeding Caucasians for 26 years, having secured some of Benton's original importation. He has recently secured a fresh importation direct from the Caucasus and will endeavor to improve the quality of the queens in all of the Rauchfuss' apiaries.

There are numerous reports to the effect that the Denver region is no longer as good as it formerly was. The growth of the city has favored the cutting up of the big farms and ranches where alfalfa was once grown in large acreage. We now find numerous small farms instead, and such alfalfa fields as remain are usually cut with little chance to bloom. The smelter smoke also has proven a serious obstacle to beekeeping in some places. Few beekeepers reported as good crops on the eastern slope from Denver northward as were formerly harvested. Several of the large producers who formerly lived in this region have moved to the western slope or to Utah or Wyoming. As the country grows older numerous difficulties arise which make the beekeeper hustle.

At Colorado Springs there is a limited amount of good bee pasturage and but few extensive beekeepers. Colorado Springs was once the leading tourist city of the West. Many now pass it by in favor of Denver, the gateway to the mountain parks. Mr. C. A. Crane, the local bee inspector, has an apiary on the outskirts of the city in a most pleasing location. It is entirely surrounded by trees, with a spring near by. It is situated on a mountain side and one has the feeling that he is far from the noise and bustle of the town. Mr. Crane is getting along in years and is content to occupy himself with only the one yard, leaving the rest of his bees in the care of Kenichi Kuramoto, a disabled Japanese soldier who served with Uncle Sam's outfit during the late war. Mr. Kuramoto expects to occupy himself with beekeeping and poultry exclusively.

On the road leading from Colorado Springs to Manitou lives H. E. Webb, who is one of the most up-to-



Herman Rauchfuss putting in foundation for his cut-comb honey.

date beekeepers to be found. He has a honey store where thousands of tourists pass and sells his honey at profitable prices right at his door. He gets 30 cents for a one-pound jar and \$1.15 for a five-pound pail. He also puts up beeswax in small cakes which he sells to the same trade. He gets 10 cents for a two-ounce cake, or 65 cents per pound for his wax. The store is shown in the illustration. Mr. Webb is also a breeder of fine white Leghorn chickens, and no beekeeper or chicken fancier who chances to pass the Webb home should neglect to stop for a call.

One of the most interesting days of my long journey was spent in company with L. S. Harner, who is an enthusiastic side-line beekeeper. Mr. Harner has a few bees high in the mountains at nearly ten thousand feet of elevation. He took me up to see them, and the change that takes place in the flora as one climbs higher is most interesting. The summer comes much later up there, but we found the bees working furiously and storing surplus. The valleys are very narrow, but much white clover has found its way into the small area available along the streams. The mountain sides were covered with wild geranium and other wild flowers which furnish good pasture for a limited number of bees. We found patches of bearberry or kinnikinnick, which is so often reported from the Pacific northwest, but it was not blooming at the time of our visit. The blue penstemon was blooming everywhere and evidently the bees

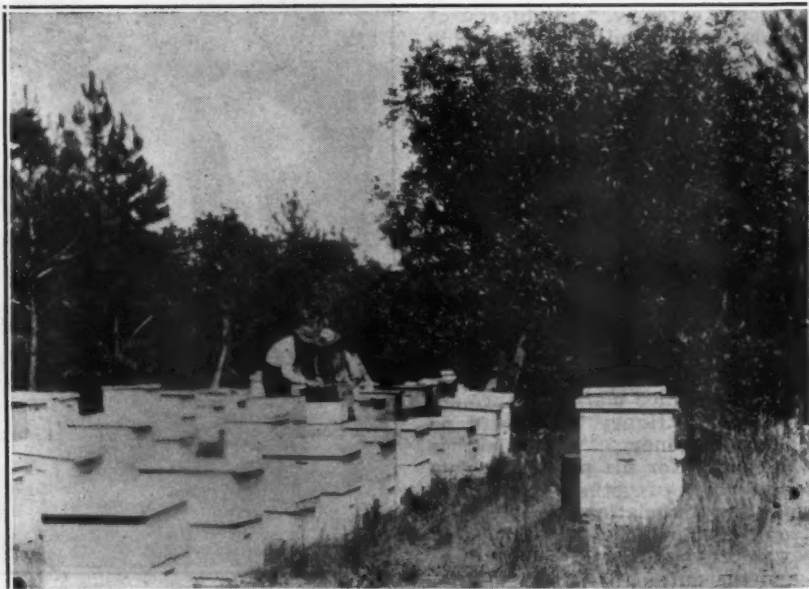
get considerable help from it. This plant is also known as beard-tongue or pride of the mountain, and there are many species common to the Rocky Mountain region. Colorado beekeepers will readily recognize it from the picture.

Willows, canyon gooseberry, raspberry, fireweed, lupine, monument plant, skunk-bush (*Rhus*), etc., provide for the bees at this high altitude.

At Rocky Ford I met Bert Hopper, one of the men who have made big money from bees. The fellow who writes to enquire whether beekeeping pays had best ask Hopper. He has a delightful home, spends the winters in California and has educated his daughters at Leland Stanford University, and the bees have paid for it all. Hopper is an exceptional business man as well as an exceptional beekeeper and is a good example of the possibilities of the industry. He started at the bottom and built up slowly with a few colonies until he has operated 2,000 colonies in 20 yards. He lost 500 colonies in the big flood of the Arkansas River some time ago, but still has enough left to keep an ordinary man pretty busy. He has produced and sold as much as \$28,000 worth of honey from his own bees in a single year. I think that I would winter in California myself under similar circumstances. At Rocky Ford the acreage of alfalfa has been increasing of late since the common farm crops have not been profitable during recent months. Hopper finds that alfalfa yields more nectar on sandy soils and that new fields yield more freely than older ones.

At Canon City I was especially interested in what Guy Sumner had to say about the big hive. The fact is that I was much surprised to find numerous advocates of the big hive at several points on the trip. In view of the fact that I had supposed all Colorado beekeepers permanently wedded to the eight-frame hive, I was hardly expecting to find such enthusiastic indorsement of my own views.

Sumner, it seems, first tried a real big hive and put seven colonies in square Jumbo hives. They averaged 400 pounds each in 1921, or '22, and he decided to look into the big hive possibilities further. Later 20 colo-



Apiary of C. A. Crane, Colorado Springs, Colo.

nies in big hives averaged 300 pounds each, which was much above what he secured from eight-frame colonies in the same yards. He has now followed his experiment far enough to be convinced that it will prove a profitable investment for him to put all his bees in large hives. He has settled upon the Modified Dadant hive as the most satisfactory for his use. Although he formerly kept bees on a large scale in New Mexico and made money while selling at the extremely low prices which prevailed prior to the war, he has decided that he can do better with a less number managed on a system which requires less manipulation. Sweet clover and alfalfa are the sources of his surplus, although he has a variety of plants from which his bees find early pasture to build up in spring.

Honey in Radiators

We have used a 50 per cent solution of honey and water and have found the same very satisfactory. We have used this in some twenty cars and have experienced no difficulty whatever, in its use.

Of course, this has been a very mild winter, and hardly a fair comparison as to what can be expected in Montana in the average winter. Still, we are going to use it next year. That is the extent of our experience.—Eddy's Steam Bakery, Helena, Mont.

We might add that we are located some 80 miles from Helena, and have again used the solution as above in our trucks, which are out every day, with very satisfactory results. Have a glass quart Keer Mason jar which filled two-thirds full and has stood on the ground outside for eighteen months, through two winters and one summer, apparently in good condition.

Cloverdale Apiaries.



Penstemon is a good honey plant at high altitudes.

Annual Meeting

The annual meeting of the Northern Illinois and Southern Wisconsin Beekeepers' Association will be held in the Court House in Freeport, Ill., on Tuesday, October 21, 1924. All interested in beekeeping be sure to come.



Webb's honey store on the road between Colorado Springs and Manitou.

Honey in Radiators

I have read several articles concerning the use of honey in automobile radiators. These all tend to show the advantages of its use. Perhaps you know we are having complications and these I believe should also be published, at least to the distributors of the anti-freeze solution. As a producer and distributor of honey I am very much interested in a new market for a by-product of this business. This winter I filled my Ford car with a 50 per cent solution and had very good success at zero weather by adding water as the solution evaporated. I also allowed the solution to evaporate below the top of the cylinder head, which caused the honey to cook down, thus closing the openings in the cylinder head and block, and stopping circulation entirely. We removed the cylinder head and had very little trouble in burning this out with oxygen. I believe if every user is advised to keep the radiator full at all times no trouble will occur. This solution will not heat in quite warm weather, even when the motor is working very hard. I am still trying further experiments and hope they will prove satisfactory.

C. L. Du Clon, D. C.,
Springville, N. Y.

Judge for Mid-West Show

We are in position to announce the honey judge for the Mid-west Horticultural Exposition which will be held in Waterloo, November 11-16, 1924.

We believe that Prof. Jager is a very happy selection and that beekeepers in all states will be glad to submit their exhibits to his judgment for premiums.

A State Chairman has been selected in all of the states in the territory of this exposition and it is assumed that large cash premiums will attract many entries.

The premium list is now available by writing R. S. Herrick, Secretary Mid-west Horticultural Exposition, State House, Des Moines, Iowa.

For beekeepers who want general information concerning the honey department, you are invited to write Prof. F. B. Paddock, Ames, Iowa, who is chairman of the department.

Stung to Death

The Daily Times-Herald, of Dallas, Texas, August 15, gives the account of a beekeeper who was stung to death by his bees. This is so extraordinary an occurrence that we believe some other and additional trouble must have been the matter.

Mr. J. W. Brodnax, 36 years old, living in Vickery, a suburb of Dallas, went into his orchard, where his bees were located, to gather some fruit, and the bees "swarmed out of their hives and stung him virtually over his entire body." The physician called said that, although some other trouble may have been there, the bees were the direct cause of his death.

AMERICAN BEE JOURNAL

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C. P. Dadant Editor
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EVENTS AT THE INTERNATIONAL CONGRESS AT QUEBEC

The Congress organized Monday, the 1st, in the afternoon, with speeches of the Lieutenant Governor, Minister of Agriculture, and other noted men; then the presentation of delegates. The attendance was about 185, 50 of whom were English speaking.

On Tuesday, the Congress divided into two sections, French and English in separate halls. The morning session was devoted to a discussion of modern methods of queen rearing, with seven or eight addresses which could not be read owing to lack of time, but of which the "rapporteur" gave a summary. The Editor of the American Bee Journal presided at that meeting in the French hall.

Among the addresses was a very long one from the French author, Perret-Maisonneuve, whose latest work on queen rearing is well known. This address was not read, on account of its length, but will appear with the others in the report.

After the session, some 60 delegates accepted the invitation to a 12 o'clock lunch, at the home of Mr. Verret, seven miles away. Two large excursion cars, carrying 25 each, and one or two touring cars, transported the guests to Verret's home in Charlesbourg. The dining room being too small, two tables were served by a swarm of pretty, young French Canadian girls, black-haired with black eyes. We learned that they were all nieces of our host. Mr. and Mrs. Verret have no children; they are past middle age, but they have 45 nieces. The French Canadians have large families. Mr. Vaillancourt is the fifteenth of his father's family.

But this was just the beginning of French Canadian hospitality. In the afternoon the question of swarm control was discussed after the reading of several addresses. These will appear, also, in the report. Later the A. B. J. Editor gave his address on "International Relations in Beekeeping Questions," which, of course, called for great criticism in the French speaking section, as most people, especially in small nations, are strongly in favor of national protection. This, of course, was expected by him and a good time was enjoyed in sparring back and forth. The world is not ready for free exchanges. Commercial wars are bound to continue for some centuries yet.

In the evening, it was announced by Mr. Vaillancourt that the entire delegation, or as many as would go, would be taken to St. Anne de Beaupre, where the famous church which contained so many "ex-votos" was burned by arson a year or so ago. There is, in this village 22 miles from Quebec, a "Cyclorama" representing Jerusalem, Nazareth, and the life of Christ. As we saw it at 10 o'clock at night, after the banquet held in the local hotel, it was very appealing, since hidden electric lights threw a mysterious halo upon the painting, which is in a circular shape and 35 feet away from the spectators. We were also shown a number of wax works. The return to Quebec, by auto, was at midnight, after the speeches, toasts and general informal talks. If other countries wish to imitate Quebec in the reception of delegates they will have to exert themselves, for much is yet to come.

TIME OF INCUBATION OF EGGS AND BROOD

None of us have ever given a thought, as far as I know, to a comparison of the time of incubation of different races of bees. But here is a correspondent who asserts that the little African black bee, the Punic, hatches more quickly than the common European bee. He writes me as follows:

"It was very interesting for me to discover that the eggs of the black bees develop quicker than those of Italians. Here is how I found it out: When I first came here (Blidah, Algeria), in 1920, I bought a setting of eggs of native chickens called Bedouins, from the Arabs. They hatched and were ready to quit the nest on the 19th day. This interested me and I bought a setting of pure Rhode Island Reds, from the Ecole Menagere at Algiers; but it took them the usual 21 days to hatch. The weather was warmer when the R. I. Reds were setting than when the Bedouins were hatched. After this experience I made some observations with the bees and found that the native blacks developed and hatched in 1 or 2 days before the Italians, and if you have a queen that gives Italians and blacks, it is always the black virgin that hatches first."—Ross T. McClanahan.

Let it be understood that although this may be said of the Punic bees, it is certainly not true with the black bees of Europe, for all the experiments of the great masters, like Dzierzon, Berlepsch, Klein, Huber, etc., were made on the common bee, as were many of our own experiments.

If any of our readers have experience with the little Punic, we would like to hear from them, as to the above, either in confirmation or in criticism.

WARNING FOR FALL

I am asked what is the most important thing to attend to, in the apiary in the fall. I might tell you that feeding the needy colonies is the most important thing. But everyone knows that. We must be sure to give them enough, not only enough to winter, but enough to breed until the blossoms yield.

However, there is one thing which the beginners are apt to overlook, that is robbing. I have many times seen good beekeepers careless about this matter. It is the most dangerous and most important matter to look after when the crop is harvested and the needy colonies are fed. A little honey spilt about the apiary, a few combs left exposed, a weak colony left with its entrance too large, and you are starting a disturbance which is much more easily prevented than stopped after it begins. Even a very strong colony may be robbed, if it is left exposed to robbers for any length of time, with the top uncovered, or with cracks large enough to admit the passage of robbers.

Usually, when we handle bees in the fall, we find it a very good thing, if there are any robbers flying around, to place a bunch of fine grass in front of the entrance, so that the bees have to crawl through that grass to go in or out. The guards install themselves in this grass and the robbers, as fast as they come, are pounced upon.

The most dangerous feature of robbing is the danger of disease transmission, which we did not fear in the old days. That is why most of our leading inspectors are not in favor of leaving diseased colonies from fall to spring to be treated. They argue that a colony having disease will be sure to dwindle during the fall and winter and may be the cause of disease spread at any time. So look out for disease and for robber bees.

EXTENSION WORKERS NEEDED

We have all met those who decry the efforts of the extension men sent out by the colleges and the Agricultural Department to help the beekeepers in their problems. Here, we have always stood by these sincere men, who, although often not so well versed in practical beekeeping as further years might insure, yet do their utmost to help. They are usually men of keen intelligence, too, well trained, and with a knowledge of how to bring to us the best of useful information.

We need more of them. This past year, one of our field

men, going through part of Illinois, found, right at our back door, many beekeepers who had never heard of the bee journals, did not yet use the best equipment, many with box hives, much disease, no associations—in short, a neglected industry pitifully equipped, and offering no returns.

Others tell us of similar observations over much wider territory and, when it is remembered that these conditions are often where there has already been some educational work done, the need for more is indeed evident. We hope that the colleges will continue this work ad infinitum and that the new man in Washington, Mr. Hambleton, will not forget that much of his predecessor's fame was based on the good his office was able to do in directly educating the beekeepers.

QUEEN BREEDERS' BONDS

Here is a plan of the American Honey Producers' League which, in our opinion, ought to give satisfaction. It is to place such queen breeders as are willing to put security on their sales of bees and queens under bonds, by the A. H. P. L. Such bonds would secure purchasers against any losses from dishonest breeders and would, on the other hand, help increase the credit of fair dealing breeders. The happenings of the past summer in the orders of queens and bees by the pound, in Manitoba, show that some such measure is needed to weed out the dishonest breeders, who are not numerous but cause the general apiarian public to look with distrust upon breeders of queens or bees, in the country.

Sooner or later we will reach a point where the purchaser will feel entirely safe when dealing with a bonded breeder of bees.

Subscribe to the A. H. P. L. and become a member; then ask for their September bulletin, which will make you acquainted with their proposal. The future of beekeeping, as of all other lines, is in co-operation.

The plan seems feasible and depends on the support and wishes of the breeders. Already a few of the more important breeders have signified their acceptance of it.

PLAYTIME AND PROGRESS

We had many letters from our Editor concerning his wonderful time at the International Congress in Quebec. It is playtime for all of them as well as a time for the serious consideration of international problems in apiculture. There were about 185 beekeepers present, representing Belgium, France, Switzerland, Italy, Algeria, Canada and the United States. Traveling from Europe is too expensive for many to come across the water, but there was a goodly handful, arriving on the S. S. "Melita" at Quebec, a good name for a beekeepers ship, since "Mel" means honey. They were all very enthusiastic. The preliminary details of the meeting are noted elsewhere, pending the return of the Editor.

(The editor is just back).

After the meetings, about 25 of the members of the Congress went up the Saguenay together on a delightful trip to Grande Baie and back. Then followed more excursions and banquets.

Contacts like this are valuable. They take us away from the sordid rut which closes about all of us when we become settled in one task or place. This meeting and all the meetings of the Congress which are to come should be marked as red-letter periods, times when everyone who can should sacrifice to attend and play his part in the progress of the industry.

At the present Congress, an Executive Committee, with Cyril Vaillancourt, of Canada; Leon Tombu, of Belgium; Mr. A. Mayor, Switzerland, and C. P. Dadant, of the United States, was appointed to fix the place for the next Congress and care for such other business as may come up.

GREAT POSSIBILITIES

Mr. C. P. Dadant has been attending the International Convention at Quebec and visiting some of the Dominion's best beekeepers. We heard frequently from him. In all his letters he showed his enthusiasm for the excellent honey producing possibilities of Canada. At Beau-

harnois, along the St. Lawrence, southwest of Montreal, he wrote: "The country appears to be splendid for honey. They keep all their bees in one spot. Mr. Prud'homme tells me of having kept a hive on scales that gained 35 1/2 pounds of weight here in 48 hours."

The Dominion should have all the requisites for developing a sizeable honey industry. With the last and freshest of glacial soils, rich in lime, the most correct latitude, and well settled weather during the period of the honeyflows, it requires only good beekeeping to get large crops.

OCTOBER IMPORTANT

There is perhaps no month in all the beekeeping year so important as October, since many of the things ordinarily done this month can make or mar next season's crop. Phillips and Demuth call it the start of the beekeepers' new year, since it is the time when we change our point of view entirely; instead of looking towards this year's crop we put that behind us and look to the crop for 1925.

The important October work can be summed up briefly: unite, feed and pack. Do not try to winter weaklings. They will not pay for the trouble. Be sure of the fifty pounds of clean stores; no raw nectar, no late gathered dark honey, nor honeydew. Then, just about the time the first frost is due, put the winter overcoat about each hive. It is the least you can do.

A SUPERB EXHIBIT

The Provincial Exhibition at Quebec (which is similar to our state fairs), this year, had a honey display, put up by the beekeepers of Quebec, that was indeed superb. There were samples of honey from 2,845 Canadian beekeepers, a co-operation in publicity for honey which we have never equalled on this side of the line. Nearly all this honey was water-white extracted.

A feature of the display was a fac simile of Eiffel tower, the famous tower of Paris, 29 feet high, all covered with electric lights and over 900 jars of honey. The tower cost over \$1,000.

HONEY WEEK

The advertising committee of the American Honey Producers' League announces that November 16-22, 1924, has been chosen as National Honey Week. The state associations in Oregon, Iowa, North Carolina, Tennessee, Wisconsin, Michigan, Vermont and Illinois have assured their co-operation.

The committee is planning suggestions for publicity and advertising of the week and outlining plans for displays in the grocery stores, the serving of honey in the restaurants, and similar measures. Let us all get busy and help. Write H. F. Wilson, Madison, Wis., for the full plans. There is only a little time to get lined up. We hope next month to have a fuller discussion of the plans.

OVERSTOCKING

Jay Smith's view on overstocking (A. B. J. page 418) is interesting since it is so different from the average one. He mentions Alexander's success with many hives in one place. There are places, however, where there is a decided limit to the number of colonies that may be successfully located in one yard. We have had that experience. But there is much in his advice: "If we get our minds on our bees, give them a chance, leave plenty of stores in a large brood nest, have good young queens, and have proper winter protection, we will get good crops if we are in a good locality." That is putting a large part of beekeeping in a very few words.

LAY YOUR PLANS NOW

Make plans now to attend your annual meeting. During the next few months most of the meetings of the state associations will be held. It is always the few loyal ones who make such meetings possible. More of us should determine to do our part. Where there is the spirit of progress, it is for our best interests as well as for the unselfish help we can give to attend each year.

OBSERVATIONS ON HONEY SOLUTION AS AN ANTI-FREEZE.

By Russell H. Kelty, Department of Entomology, M. A. C.

HUNDREDS of motorists have used honey-solution for an anti-freeze for radiators in Michigan for a sufficient length of time to show up its advantages and some of its possible weaknesses.

We believe that if honey-solution is to come into general use as an anti-freeze certain improvements should be made in the method of manufacture. Haphazard methods of mixing the honey and the water together, the length of time the honey and water are boiled and the failure to observe certain precautions in using the solution are factors which may lead to dissatisfaction on the part of the customer.

We have tried to canvass the situation in and around Lansing, especially, where a relatively large number of motorists used honey-solution last winter, and have tried to discover the causes of dissatisfaction in cases where trouble was reported.

A rather common objection is that honey-solution has a tendency to seep through hose connections and gaskets. For this reason every motorist should be instructed to inspect the hose connections and gaskets before using the solution, and if necessary tighten or replace them, using grease or shellac to water-proof the joints.

Another objection frequently mentioned is the tendency for the solution to thicken sufficiently under low temperatures to impair the circulation in radiators employing the thermo-siphon system. This is especially true in the colder regions where it is necessary to use a solution made of three volumes of honey to two volumes of water, or in the coldest districts where a solution made of two parts honey to one part of water is used.

There are two ways of diminishing and possibly of entirely overcoming this tendency. The addition of one quart of either wood or denatured alcohol during the process of preparation will, if the solution boils four or five minutes, cause a heavy scum to rise to the surface of the solution. This scum, which is to be skimmed off, contains among other things, dextrin and pollen; and honey-solution prepared in this manner not only circulates more freely in the radiator but also will withstand lower temperatures without "slushing," than the same solution prepared without the "boiling with alcohol," process.

For instance, test-tubes containing three parts honey to two parts water boiled for five minutes, "slushed" somewhat at 15 below zero. Test-tubes containing solution in which the dextrin had been removed by the "boiling with alcohol" process remained clear and flowed freely at 15 below zero.

Furthermore, the addition of two quarts of alcohol to three gallons of honey-solution after it has been placed in the radiator, will greatly improve the circulation at low temperatures.

All motorists driving cars without water pumps should be urged to use "chest protectors" over the lower 8 inches of the radiator in temperatures as low as 10 degrees below zero. Motorists who drive steadily each day should watch the level of the solution in the radiator and occasionally add sufficient water or alcohol to keep the level of the solution above the upper hose connection at least, or about two inches below the overflow pipe outlet.

We know of some instances in which real trouble resulted from failure to watch the level of the solution. When, as a result of evaporation, the honey-solution became so thick that it did not readily pass through the radiator cores and circulation was cut off, steam generated in the engine head developed sufficient energy to burst the upper radiator hose connection. This happened during 15 degrees below zero weather and there was no water pump on the radiator, and no "chest protector" was being used.

Undoubtedly some of the trouble reported is due to the fact that the honey-solution is not properly made. Our experiments would indicate that the proper method of preparation is to heat the required amount of water to boiling, stir in the required amount of honey and bring the honey-water solution to a boil, add a quart of either wood or denatured alcohol to three gallons of solution and boil for from three to five minutes. After removing the scum the solution is then ready for use.

Another objection offered is that the honey-solution in some cases seems to cause the engine to over-heat. We feel that this is entirely a matter of circulation and will be automatically cared for if the precautions already noted are observed. For the boiling point of honey solution made of three parts honey to two parts water is but three to five degrees higher than the boiling point of water. In fact, many feel that this slightly higher boiling point is a distinct advantage, since the engine gets better radiation and possibly better carburation. Possibly the reason for the apparent over-heating is that the light oil commonly used in winter, thins readily, and, since the boiling point of the honey-solution is 20 to 30 degrees higher than the boiling point of alcohol-water solution, the engine appears to be hot when it is really at summer heat. The use of a moto-meter is a great help in this connection.

One of the best arguments in the favor of the use of honey-solution is that it is entirely safe against freezing damage to the radiator. Since the temperature at which honey-solution "slushes" depends on the percentage of honey therein, the following formulas are recommended: To resist temperatures as low as zero, equal volumes of honey and water; for temperatures as low as 15 below zero, three parts of honey to two parts of water; for temperatures below 15 degrees below zero, two parts honey to one part water, by volume in all cases. In extremely cold weather, the motorist should add two quarts of alcohol to the radiator full of solution to improve the circulation, as previously mentioned. Honey-dew, unripe or fermenting honeys should not be used.

Should the solution "slush" in the radiator, it can be readily liquified by running the engine three to five minutes with a blanket over the radiator. After the engine is hot stop it and let the heat warm the solution. The "slush" liquifies at a very low temperature and once circulation is started there should be no further trouble.

Experiments show that honey is about twice as efficient as sugar-syrup, glucose or molasses for depressing the freezing point. For instance, a syrup made of two parts cane sugar to one part water will solidify at about 10 degrees above zero.

Motorists who have given honey-solution a fair trial report favorably with few exceptions. Many say that it is exactly what they have been waiting for. Practically every case of dissatisfaction is due to either faulty preparation or abuse of the solution while in use. Beekeepers would do well to use honey-solution in their own cars and to even supply their friends with honey-solution, if necessary for advertising purposes. Certainly the demand which would be created by the general use of honey-solution in radiators warrants any effort that can be made to secure its adoption by the motoring public.

Honey in Bread

Here is a good slogan for honey consumption, and we know it is true:

Bread made with milk and honey doesn't dry out like that made with sugar, and has a very delicate and tasty flavor; and then again, it is conceded throughout the land that honey is a far more healthful food than sugar; so why use sugar when honey is far superior all around?

Elias Fox.

Shipments to Europe

The Superior Honey Company, of Idaho Falls, has recently made a car shipment of honey from its Idaho Falls warehouse to London, England. This brings the shipments of this company up to twenty carloads for the year. A car shipment was made earlier in the season to Scotland.

THE ULYSSES OF WESTERN BEE-KEEPING

By F. R. Arnold.

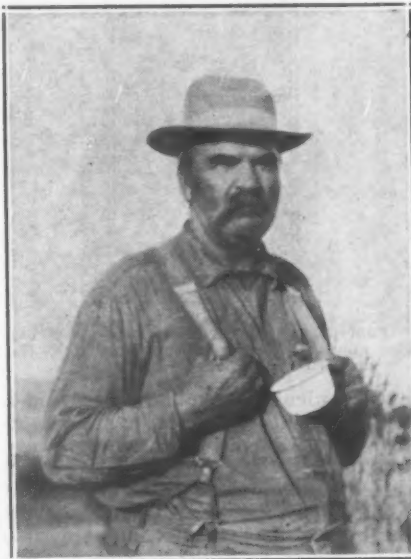
The western beekeeper most deserving of the name Ulysses, is Thomas Chantry, of Wellington, Utah. He merits this distinction not because he is a beauty-worshiping Greek. He isn't. He is the only Quaker in a tiny Mormon town and his name tells you his ancestors must have been Norman-French. He is, then, a Ulysses neither by race nor religion, but only because, like the Greek hero of old, he is a man of many devices and has made more than one Odyssey. And as both the devices and the wanderings have been all to the glory of the bee, you see in him one of the inspired beemen, the men predestinated to be presidents of bee associations, the men who suffer poignantly when remote from propolis.

Wellington is in Carbon County and that connotes much both for the farmer and for the beekeeper. The farmer knows that because of the near-by coal mines he can get the highest prices in the state for farm products, while the beekeeper will readily recall that the prize honey of the San Francisco exposition came from Emery County, a few miles to the south, while up to the north lie the wonderful bee pastures of Duchesne and Uintah counties, so rich in sweet clover and alfalfa. Mr. Chantry says it is surpassed only by Dakota for area of sweet clover pasturage. He calls sweet clover the pre-eminent honey plant of the world, but for alfalfa, which requires both altitude and weather to produce nectar, Utah bee pasturage is unequalled.

Mr. Chantry's Wellington colonies are located in a greasewood pasture in the midst of alfalfa fields, by the Price River. If you visit him in May you will probably find him clipping queens and you will find him quite ready to talk bees even if you are a mere amateur. He sits on a sheepskin-covered tool box, open in front so as to give immediate access to any tool he may need. All around the bees are coming in laden with the orange red dandelion pollen and as you follow him from queen to queen you will note many contrivances beside the portable tool-box seat. You will notice that the entrances are temporarily stopped up with mud so as to make warmer hives for breeding; the hives all rest directly on the ground so that any bee shaken off from the frames may have no difficulty in finding her way back to the hive; each colony has only nine frames, as Mr. Chantry holds that the bees breed better with extra space and that he gets more bees with nine frames than with ten. His method of registering his work with his bees is also unique. The first year he does not clip the queen. The second year he cuts one wing; the third year he cuts the other, and at the end of the third year he supercedes her.

Instead of defacing his hives with ineffable marks, he uses small stones as tallies. Four on the top of the hive indicate that it contains no queen; three, an extra good queen; two, a queen cell; one, a virgin; and no stones, a good queen. In his method of stretching wires on his frames he has many mechanical devices and also in his way of sterilizing honey, so that you can visit him at any time of the year and find many ingenious tricks, whether he is working out or in.

Mr. Chantry says he has quit paying attention to the color of the bees in Utah. He believes that certain bees fix themselves to certain altitudes and the best bee for his altitude is the cross between the Carniolan and the Italian. He finds the



Thomas Chantry.

Carniolan strain the best for wintering and for early breeding. He pays no attention to color but breeds from strong, gentle hybrids which, according to him, are far better than pure Italians. How the Carniolan strain got into his locality is interesting. A Carniolan queen was introduced 25 years ago by Andrew Nelson, of Ferron, in Emery County, who obtained her from Frank Benton, a national apiarist, and now all the bees within a radius of 100 miles from Ferron, in Emery County, have the Carniolan strain and with it the most desirable qualities for the locality.

Mr. Chantry is a much traveled as well as a resourceful Ulysses. Raised with the Quakers in Iowa, he says he was 15 years old before he realized that men could lie or steal. Evidently he had not done much traveling before then. His father used to think he wasted his time because when he sent him on errands as a boy he would loiter along the road for hours watching bees and birds and spiders, in spite of the paternal injunction to "hurry right back," Iowa farmers in those days, fifty years ago, did not know there was a honey business. They "finished" each

year a carload of hogs and one of cattle. That was the only conceivable way of earning a living on a farm. One day when he was 11 years old the Chantry boy found a bee tree and adopted the bees. There was no one to tell him how to handle them, so, after a year or two, he went on his first Odyssey, driving 75 miles to a bee expert to buy a queen for \$3.50 to put with his wild bees. He hauled her home in a buggy, after getting some ideas on smoking and hiving bees. He watched his bees every day, read books and journals, and though the family had all the honey they could eat, his father still considered his work with bees just fooling time away. He had to work on the farm and do his bee work noons. In fourteen years he increased his wild bees up to forty colonies and never saw a swarm either hanging on a bush or in the air, so well had he come to understand swarm control. His bees soon gave him pocket money, for he began to sell queens and nuclei, but it was not until he was 21 and trying to get money enough to go to college that he made the great discovery that there was a bee business which might be made to pay better than general farming. He was working forty acres of corn and twenty of wheat and found when he sold his crops in the fall that he had \$78 profit on his grain, while his eighteen hives of bees were paying him that season \$187. And yet he had worked five days on his farm and only Saturdays on his bees. So he went to college and stayed there through seven years of preparatory and college work, but all the time he knew that bees or teaching would be his life work. No more farm for him, since the bees were putting him through college.

And yet marriage took him to a sheep farm near Vermillion, South Dakota. When the farm dried out he began handling bees for other people and from the 20 colonies he had on halves, the first year, he acquired 190 of his own and the next year he started with 300 of his own and others. This fixed him for good and all in the bee business, an occupation that he has pursued in California and Utah as well as in Iowa and Dakota. A college man, Mr. Chantry reads both French and German authorities on the bee and has a unique library of bee books; an ingenious Yankee, he has many labor-saving schemes; a beekeeper who has roamed in many lands, no wonder he is president of the Utah Honey Producers' Association. No wonder, also, that when he compares other bee pastures with his Utah Valley, you feel that he speaks as one having authority when he says he has never found a valley where more perfect comb is produced nor one containing more up-to-date beemen. Small wonder, also, that an extension worker of the United States Department of Agriculture remarked after a day with him, "If I could camp on his trail a year, I'd know something."

Logan, Utah.

DEVELOPING THE LOCAL HONEY MARKET

No. V—Window and Counter Displays and Dealer Helps

By C. L. Swanson.

MANY beekeepers have experienced the difficulty of getting grocers to move honey, to push it, to aid their customers to buy it. The grocers are much more interested in selling out a car of flour or a large quantity of potatoes. Such articles will sell as long as people eat and the grocer feels the effect of advertising such commodities much more quickly than a specialty such as honey.

So, after stocking our grocers with honey, our next problem was to sell any additional quantity the grocer took besides the orders from consumers that we gave him to deliver. Selling our honey to the grocer was well described in the September number of the Journal. We were well pleased with the result; in fact I, personally, was afraid we were overloading the dealers, judging by the amount of honey already distributed over the city. The stock of honey on the grocer's shelves and my fears vanished quickly together.

Window Displays

After we had delivered the honey to the grocers, we made another trip to the stores to set up displays. We asked permission to do this and in every case our request was granted. In fact, many of the grocers telephoned us, before we could reach them in rotation, to give them a display.

Our hearts failed just a little (or perhaps I should speak only for myself). As far as I knew, none of us, on this little expedition, had ever set up a display of this kind. The grocers were very kind, indeed. When we came in and told them what we wished they gave us a window in practically every instance.

When one takes a bare window to make an attractive display with the equipment we had, he needs a strong heart and a scheming and designing brain. We didn't feel like spending a lot of our honey profits, so we used largely the empty lithographed pails of attractive design that we used for our honey. In addition we had a few window cards printed with little catchy phrasing to attract attention. We used these and the "Honey, Dat's All" signs to good advantage in windows, doors and around the scales and cash registers where they would be prominent. A little sign, "Don't Forget Your Honey," on the inside of the door where it will be seen by the departing customer acts as a suggestion to purchase.

When I was a school boy I remember a grocer who could sell enormous amounts of peaches when they were plentiful and a drug on the market at most stores. His idea was to feature peaches. When you walked near his store you saw baskets of peaches on the sidewalk, peaches being unloaded from wagons and loaded on delivery trucks, peaches in the win-

dows, and boxes and baskets of peaches inside. Quantity was his advertising feature and one would naturally buy peaches at that store. So one of our points was quantity. We would pyramid empty lithographed pails in the windows in an attractive design suiting the design to the space allotted to us.

Most of the windows had no background, but with our pails we made

hibit was made up largely by either using the honey the grocer had in stock or using empty pails. We were careful to put the lids on the empty pails securely so they appeared the same as those which were filled with honey. People don't mind being harmlessly fooled. Later the pails were taken out and returned to our honey house to be used in packing honey.

A Few Pointers

We found it to advantage to place cards, pictures or any article that we wished the customer to see, up at a level with the eye. Even then contrasting color or something moving is necessary to draw attention to a printed card in the inside of the store. This is due no doubt to the great number of placards in every store exalting the virtue of soap, ham, coffee, etc. The next time you go into a grocery just notice the different advertisements that are in evidence.

We also had a limited number of leaflets printed in several colors, giving a few recipes and a very good description of honey. The prices were printed on them and a few were given to customers whom we thought would be interested in buying honey.

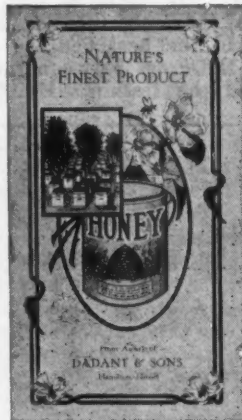
Throughout our window display, we carried the sign "Honey Dat's All" in prominence so that there would be a connecting link between our canvass, our newspaper advertisement, our display and the honey that the customers could obtain.

In some of the stores we used as many as 300 pails. This was exceptional, however, and the majority of the displays only took from 25 to 50 pails. This makes a pretty big showing in a window or counter.

Each time we called on the grocer to take additional orders, we changed his display a little, straightening up cans and cards, dusting them, etc. We learned never to lean a card against a can or other object, even though the can was one of our honey cans in a prominent place. These cards are too easily knocked down, and should be fastened or tacked where they cannot be easily dislodged. We usually put up from 4 to 10 cards in a store.

Using Observation Hive

In one of the window displays that brought the greatest interest and comment and which was the most easily arranged, we used a 1-frame observation hive with bees. We could not continue using this, however, because it was so hard to take care of the bees in the cold winter weather that we have here. We placed a number of hives in different stores and told the storekeeper how to keep the bees warm for the night. Even with this arrangement the bees began to die in about 3 days and, of course, had to be removed. In one case the grocer took



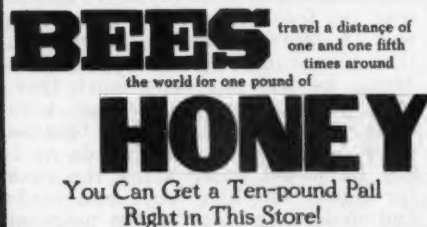
Four-page honey leaflets were given in quantity to the grocer for distributing with his orders.

a very nice background, reserving a central point for cards or special attractions. Sometimes a window card was used in the center of a large picture of one of our apiaries. A case of comb honey with glass front to show the honey inside made a nice article about which to build a display.

The grocers were always willing to lend us anything within reason to aid us in making our windows more attractive. We found that pancake flour in attractive boxes was good to use for variety, and we had cards urging customers to try hot cakes and Dadant's honey. We never failed to get the name of our brand of honey before the customer. We did not allow them to think only honey, but 'Dadant honey.'

Counter Displays

Besides the window display we usually had an opportunity to put up a counter display or a display on a shelf in the store. The counter ex-



A sample of one of the catchy signs we used in windows and on shelves of grocery.

the observation hive to the back of the store where it would be warmer and covered it with a coat. After the hive had been placed there, one of the clerks unknowingly and accidentally broke the glass in the hive. Of course, the bees, being warm, began to emerge slowly because of the coat over the hive. However, it was soon noticed by the storekeeper and he telephoned us to come and get the bees at once, and was very irate. Not many of the bees had escaped. We fixed the cracked glass with adhesive

tape and used it in the window for several more days. Although the grocer was rather irritated, at first, he soon realized that it was really more his fault than ours, and he has continued to be one of our best deal-

Follow-up Letters

In addition to our canvass, our advertising and our displays, we sent out a number of letters to prospective honey customers in Keokuk, urging them to use Dadant's honey, buying it direct from their grocers.

The grocers gave us what might be termed a preferred list of customers. This list embraced the heaviest buyers of groceries. The letter we used described honey as a word, showing that it has always meant the superlative of sweet. We then told of the wholesome qualities of honey and mentioned an authentic case right in the city of Keokuk, giving name and address of a lady who found that her child was able to eat honey with healthful results whereas other sweets caused illness. These letters

AND THE CHOICEST VARIETIES
La Touraine
Coffee

HONEY-BUTTER

FINE FOOD FOR YOUNG/TER/

HONEY-BUTTER consists entirely of honey. It is the nature of honey after removal from the comb to crystallize. If crystallization takes place at a low temperature and with occasional agitation, the result is **HONEY-BUTTER**.

To keep honey liquid, it must be subjected to heat. This causes loss of flavor and aroma. **HONEY-BUTTER** has all the natural flavor of fresh honey.

An attractive window display like this is welcome in any store and helps move a good deal of honey. This is one set up by Allen Latham in Connecticut. We could not get the lighting right to secure a good picture of any of ours.

were mimeographed on the grocers' letterheads and sent out in the grocers' envelopes.

We believe that the best time to send such a letter is about one month after the canvass. Other follow-up letters can be sent, as the effect of them is felt. If they are bringing in sufficient returns, it may be profitable to keep a series of letters ready for the winter months.

There is one thing to bear in mind in putting up a display in the grocers' windows. Perhaps they won't feel very enthusiastic about it at first, but if you can get a few of them to allow you to put in a display the rest will be more than willing to have you do the same. In fact, it seems that they feel that they are being outdone by their competitors if they turn down a proposition and some near-by grocer accepts it.

In suggesting putting in a display we mentioned that it was to our mutual benefit. We did not feel that we were doing it all for ourselves, as he was getting a good margin of profit on the honey that he handled. We believe that the grocers felt the same about it and realized that a window we decorated would be that much labor saved for themselves.

We were at one time in need of a supply of lithographed cans which we were using as a display in one of the stores. The first time our driver called for them, the grocer refused to let them be taken from the store. We had to assemble a different display before we could get these cans without a warrant. So, if your grocer does not seem overjoyed at the prospect of a honey display at first, don't get disheartened, but show him it will please and attract.

An experience with one grocer will be of interest. This grocer is what the salesmen call "hardboiled." He runs his store to suit himself and does a remarkably successful job of it. He is open to about as many suggestions in regard to arrangement of goods as Buda is in the manner of correct sitting postures. His name betrays a Scandinavian ancestry and my name is a little on the same order. It was when Greek met Greek, only perhaps a little more so. In the end I obtained permission to help decorate his window on the Sunday morning before Christmas, and when we got through he asked me how I sneaked in so many honey suggestions. His first order was "Send about what honey I can sell," and after that, "About six 10-pound pails, twenty-four fives and something less than 500 two and one-halves." We were careful not to overload him and he sold a large quantity of honey for us. But at that I still feel that he is diamond-cut and case-hardened. We need that kind. It makes us work. (I hope he never sees this.)

Are the increased profits enough to pay for this expense of window decorating? We can loudly say "Yes." This is largely a competitive life. Survival of the fittest rings true throughout the world, although civ-

ilization maintains a sort of equilibrium to counterbalance, in some measure, the difference between individuals. When we make an effort and show our co-operation with the merchant, he is more ready to give our honey a preference over the product of a beekeeper who sells his honey to the merchant and consumer at the same price; who puts out an inferior grade of honey; and who aids the grocer in no way to increase his sales.

Others sold honey at lower prices than ours. This was not a material injury. People believe low prices mean low quality and poor distribution. If the consumer is willing to pay the grocer his profit for handling flour, potatoes and other staples, why should we think that this same consumer is unwilling to pay for convenience on obtaining honey?

Don't for a minute think that our displays are at an end. Next year will see some honey windows in Keokuk to write home about. Even now plans are suggesting themselves for a bigger and better year for honey sales. If we can train a troupe of bees to carry miniature buckets of honey from the hives to the counters, we ought to have a side show attraction. The work of training, however, falls to Cale and Watt, who have charge of the bees. A display of liquid honey in five-gallon glass jars or a few newly drawn combs of sealed honey would be attractive. A demonstration day with honey and hot biscuits would go over big.

A consoling thought is that besides the good we did for ourselves, we aided beekeeping and honey selling in general.

Next month we will tell you some of the results that were obtained for us in this experiment and will also try to give some idea of the costs and permanent benefits.

BEEES STINGING POULTRY

South Dakota asks, in your August number, page 384, if you ever heard of bees stinging poultry. Perhaps an experience I had, some years ago, might be interesting to him, if you care to publish it.

A friend of mine (who, because of ill health, was obliged to seek relief in a sanitarium) asked me if I would take care of his bees while he was away. This responsibility I readily assumed and immediately took possession of four hives of bees, removing three of them to a yard some four miles out of town. The fourth hive I placed in the rear of my business office in town.

This was in the late fall and the hive remained there, unmolested until early spring. One Sunday morning, it occurred to me that I had better examine that hive to see how its occupants had stood the winter. I gave them a little smoke, and after a few minutes I removed the cover. Then the fun began! They proved to be the most vicious colony of bees I ever handled. In a moment the air was full of angry bees, and I was

forced to seek shelter for my own protection. While I was busy getting rid of bees that had followed me into my office, I heard a great commotion in the poultry yard outside. The air was now full of bees and poultry! There were about twenty hens in the yard—an equal number of White Leghorns and R. I. Reds. I rushed to the window and saw that the bees had literally covered the Reds and were stinging them unmercifully! Out of sympathy for the poor hens, I rushed out and drove them into the poultry house and shut the door; but the poor creatures were so crazed with pain they flew in a body against the door and burst it open, flying out again where the air was still thick with bees.

Four of the Reds flew over the fence into a neighbors yard and into a small unoccupied building, where they were found dead the next morning. Two hens and a beautiful cockerel crawled under a large building, where it was impossible to get at them, and I concluded that they had died also; but, much to my surprise, four days afterwards, they appeared in the poultry yard; but, such woe-begone birds you never saw! However, careful nursing brought them back to health again, and in the meantime the colony of bees had been moved out of town.

Not one of the White Leghorns was touched by a bee! This proves to me that bees are not "color-blind" but, like the bull, are enraged by the flaunting of a red rag!

Millard F. Freeborn,
Nantucket, Mass.

Propolis vs. Adhesive Tape

In case you cut yourself and do not have any adhesive tape with which to bind up the wound, follow the following procedure: Wash the wound carefully and, after it has stopped bleeding, cut a piece of gauze bandage or finely woven white cloth a little larger than the size of the wound, heat some propolis on a clean knife, spread thinly over the entire surface of the cloth, and place directly over the wound while the propolis is still warm. This bandage will securely close the wound against infection and will do away with the necessity of a cumbersome bandage. A pad of gauze may first be placed over the wound and held in place by a propolized cloth. However, as propolis has certain healing qualities, it is better to place the propolis directly on the wound in case of small injuries.

J. E. Eckert.

North Carolina.

Manitoba Honey Producers' Association

The Manitoba Honey Producers' Association was organized this past spring. They plan to ship all the honey of the members to a central point for grading and marketing. By agreement, the beekeeper receives sixty per cent of the wholesale value of his honey as soon as it is graded; the balance in 3 months.

BEES FLY FROM HIVE TO DIE OF OLD AGE REGARDLESS OF OUTSIDE TEMPERATURE.

By E. F. Pittman.

FOR the past three winters I have wintered my bees in packing cases as recommended in the Government Bulletin No. 1012, "Wintering Bees Out of Doors." I much prefer the single colony case, because it is easily handled by one's self. I make them from 5-16 inch material taken from boxes in which glass has been shipped. I procure them at the sash and door factory for 20c each. Three of these make a complete winter case, except the four corner posts and bottom of case which is made of heavier material. The hive bottom and tunnel are also made of heavy material. The case is covered with a thin, but very durable roofing, and I believe if kept well painted, will last for ten years, even if left out of doors all the year.

I use planer shavings for packing material, and I can get them for nothing during the summer, or for 2c per bushel in colder weather. I use eight-frame hives, and for 4 inches under, 6 all around and 8 on top, it requires 9 bushels of shavings for each case.

For three consecutive winters my bees have come through without any loss, and I believe in a 100 per cent condition. After the first winter I made two 1-inch holes between the three 3-8 inch holes. These larger holes are kept closed with ordinary corks until in the spring, when the bees begin to bring in pollen, when one cork is removed, and in a few days the other. The first winter, with only three small holes for spring use, the bees got uncomfortably warm and set up quite a roaring, which was the cooling process going on by fanning. Since using the larger holes for ventilation, I have had no trouble at all. When I remove the colony from the winter case, the bottom board, which stays in the case, is as clean as if no bees had been kept in the hive. This is because when bees are properly packed with planer shavings of the thickness named above for this latitude, there is no moisture produced upon the cover or walls of the hive, for the reason that the hive temperature is kept so high that the dewpoint is never reached, hence there can be no moisture collect on cover or walls.

And the bees are never in a compact cluster; but spread out on most of the combs, same as they would be when the temperature out of doors is 57 degrees. I know this to be true, for during the past three winters I have noticed that bees fly out to die of old age, no matter what the temperature outside is. Hence, if no bees die inside the hive during the winter, there are none on the

bottom board in the spring to be cleaned out either by the bees or their owner. True, when snow covers the entrance to such an extent that a bee cannot crawl through before it becomes numb, it will necessarily have to expire within the hive. In this case some of the other bees will drag her out the first day the snow is not over the entrance and the temperature outside raises to 50 or above. And if the 50 degree temperature does not come soon, they will drag all dead bees to the 3-8 inch entrance and push them out. I have watched this closely ever since I have been using the winter packing case, and on December 31, this winter, I began an investigation that has proven to me without a doubt, that if the bees are in a normal condition to fly, that is, warm enough, they will crawl to the entrance and fly, even when the temperature is 20 degrees below zero.

The following is the result of my investigation with five colonies in my back yard: December 31 maximum temperature was 6 above at 2 o'clock. At 5 o'clock I found one bee from each of four hives, about six inches from entrance. None had come out of the other hive.

January 1, maximum temperature 5 above at 5 o'clock. One bee from one and two from another. Three hives had snow over entrance. January 2, maximum temperature was 19 at 1 o'clock. Two bees from each of two hives and one from another. Two colonies still have snow over entrances. January 3, maximum temperature 5 at 3 o'clock. Three bees from one and one from each of two others. One bee was 12 feet from hive entrance, all others about six inches. January 4, maximum temperature was 2 above at noon, running down to 10 below at 5 P. M. One bee from one case and two from each of two others. One bee came through a thin coat of snow over the 3-8 inch hole and dropped four inches from entrance. January 5, maximum temperature was 9 below at 3 o'clock. Three from one and one from another. Snow still over entrance of two cases. All observations were made at 9 A. M., and 5 P. M. On the morning of January 5 one bee had come out between daylight and 9 o'clock, when the temperature was 20 degrees below zero or lower. The minimum for the night of January 4 was 22 degrees below, and at 9 o'clock (the hour I saw the bee) it was 20 degrees below.

When I removed the snow from the entrance of the other two cases, a dead bee dropped out of one of the 3-8 inch holes, and I could see a bee in another hole where the bees had put her preparatory to pushing her

out. I have noticed the same program carried out by the bees in my outapiary. I have a good windbreak at both places.

Des Moines, Iowa.

NEW KIND OF POLLEN POISONING

I have certainly had my share of tribulation this spring, for besides dealing with the worst epidemic of swarming in many years, I have transferred 200 colonies to new deep-frame hives, and most of the time have been suffering from skin poisoning from some kind of pollen that the bees come into contact with, and in spite of the fact that I wore gloves all the time my hands and forearms were so sore that it was often difficult to work, while for about a week my face was so swollen that my eyes were nearly closed.

All this was accompanied by a maddening itching and smarting, especially at night, and I have lost so much sleep that it leaves me in a worn-out condition.

Doctor's prescriptions seemed to have little effect, and I believe that the mixture of kerosene and vegetable oil that I smeared over my face, hands and arms at frequent intervals while at work prevented much fresh infection and thereby enables me to keep on with the work that was so urgent.

It seems that this poison remains in the skin much longer than does that of poison oak, from which I have often been poisoned years ago.

My hands have been poisoned to some extent in this country each season, but never like this, before.

H. E. Weisner, Tucson, Ariz.

(The above is a new thing to us. We have heard some of beekeepers being poisoned to a certain extent by the dust of dry propolis when scraping it from sections. But we have never heard of skin poisoning from pollen. Pollen from ragweeds (Ambrosia) causes hay fever in a great many people, by inhalation, but no skin irritation that we know of. It would be well to find out more about this pollen and its source.—Editor.)

Mid-West Horticultural Show

Iowa beekeepers are urged to prepare exhibits of their honey, both comb and extracted, and beeswax to be entered in the Mid-west Horticultural Show at Waterloo, Iowa, November 11-16, 1924. Beekeepers from other states will get all of the premiums possible and it is up to the beekeepers of Iowa to get their share by making a creditable showing.

C. S. Engle,
State Chairman Beekeeping Dept.

"Beekeeping in South Africa," second edition, by A. J. Attridge, is published at Johannesburg. It is a book of 100 pages, in very compact form, but containing a large amount of information. The author evidently publishes some of his own microscopic studies.



THE SEAT OF THE SENSE OF SMELL IN THE HONEYBEE.

Part II.

By John H. Lovell.

IT is well proven, says Dadant in the "Honeybee," that the organs of smell are on the antennæ. Most biologists who have carefully observed the habits of insects during the past few years have come to a similar conclusion. Forel does not hesitate to say that it has been demonstrated by his control experiments, which leave absolutely no grounds for doubt, that the antennæ functions as organs of smell. It would be of interest to consider the investigations of this sense, which have been made in many different groups of insects, as wasps, ants, flies, beetles and dragonflies; but in this paper we shall restrict ourselves to the honeybee. In a long series of admirably conceived experiments, in which the bees were not confined in any way, v. Frisch has recently shown conclusively that the olfactory organs are located on the antennæ. It will be possible to describe only the more important experiments; and, even then, many minor details must be omitted; but his conclusions will, we believe, be accepted by every unbiased beekeeper. (See Ueber den Sitz des Geruchsinnes bei Insecten, p. 68, with 7 figures in the text and 2 plates. Jena. 1921).

Bees With the Antennæ Intact Easily Distinguish the Odor to Which They Have Been Trained from Other Odors

Four square glass plates, 10 centimeters long on each side (a centimeter is about three-eighths of an inch), were covered with a double layer of blotting paper, which was folded in around the edges and thus made secure. (See Fig. 1). On each plate was placed a glass dish. One of them was filled with sugar water; the other three remained empty. Around the food dish filled

with sugar water were dropped at equal distances apart 8 drops of verbenal oil, which served as a scent substance; around each of the three dishes, which were empty, were dropped in the same way 8 drops of marjoram oil, a different scent. The plates were laid on a table at the corners of a square, at a distance of about 50 centimeters from each other.

Five bees, marked on the thorax with different colored dots to distinguish them from each other, were trained to visit the dish filled with sugar water on the plate scented with verbenal oil. All other bees coming to the plate were impounded. In Fig. 1, by accident, all five bees were at the plate at the same time. The place of the food plate was frequently changed in order that the bees might not orient its position in regard to the other plates. If the odors became weaker their intensity was renewed by means of fresh drops. An hour's training appeared to be sufficient.

The four plates were then removed and in their stead four others with fresh papers, fresh scent drops and clean empty dishes were placed on the table. Naturally the training scent plate, on which the food dish was now empty, was not laid in the same place as during the last feeding. During five minutes, bee No. 1, 9 times; No. 2, 8 times; No. 3, once; No. 4, 13 times; No. 5, 8 times; alighted on the plate with the verbenal scent (the training scent). Not a single bee alighted on the three other plates which were scented with marjoram oil.

The previous conditions were now restored again, and feeding was practiced for a quarter of an hour; since, if it were not possible to gather any food, the bees would soon fly away.

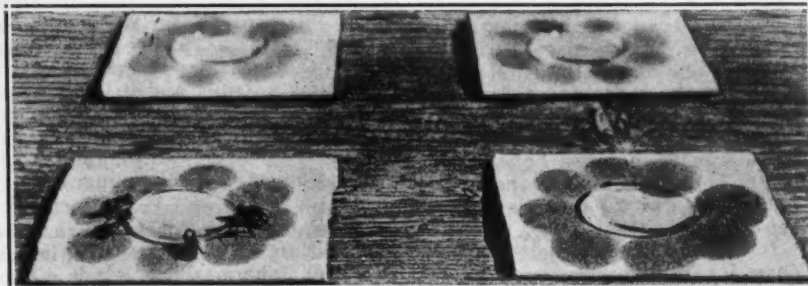


Fig. 1. Four square glass plates are covered with blotting paper. A glass dish is placed on each plate. The dish on the training plate is filled with sugar water; the dishes on the three other plates remain empty. In the first experiment, the training plate is scented with verbenal oil, the other three plates with marjoram oil. Five bees are at the training plate.

Bees With Both Antennæ Cut Off at the Roots Cannot Distinguish Between Crops

Experiments in the amputation of feelers, or antennæ, were then begun. In the case of bee No. 1, the attempt miscarried. After the antennæ had been removed and the bee set free, it flew away instead of coming to the research table. After an interval of time bee No. 5 was seized with a forceps net and both antennæ cut off at the base. The other bees, which had alighted on the food dish, were impounded in a small chest or box, while those which were absent were captured with a butterfly net on their return. After four clean plates, covered with fresh papers and provided with new scent drops, on which were four empty clean dishes, had been placed on the table, the bee which had been operated upon was set free.

She at once flew to the place where formerly she had found the verbenal-scented plate, on which had been a dish of sugar water. Now in this spot there was a plate scented with marjoram oil. Had she still possessed her antennæ, as has been shown in an earlier experiment, she would have hurried away and flown to another plate. But our antennæless bee settled down on a drop of marjoram oil, visited the dish, and finding it empty flew up in the air (Fig. 2). Immediately afterwards she alighted twice on this plate. Then she flew to the verbenal-scented plate, and hovered a short distance above it. As she was poising in a cloud of vapor given off by the drops, this odor should have acted very powerfully on the pores on the wings and legs, if they are olfactory organs, as McIndoo imagined. But the bee turned away from the verbenal-scented plate just as quickly as from the one with a different scent. She next flew to a plate with the marjoram scent, which was in the place where the food plate (verbenal-scented) had formerly been, and persistently returned and visited the empty dish six times. It is clear that after the loss of her antennæ the bee could no longer distinguish the verbenal-scented plate from the plates having a different scent. At the end of five minutes the former conditions were restored; the imprisoned bees were set free and again permitted to feed from a dish of sugar water on the verbenal-scented plate.

After ten minutes bee No. 2 was caught and its antennæ cut off at the roots. As soon as it was free, it

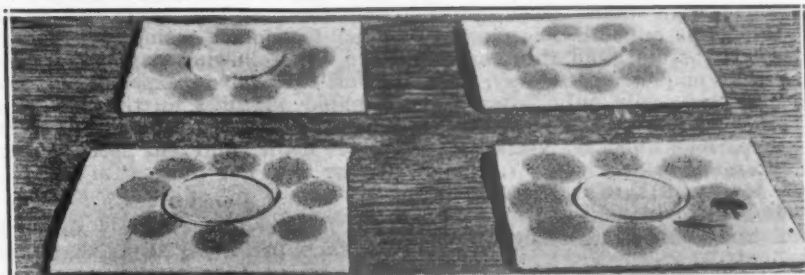


Fig. 2. A bee without antennae is searching for the training plate. It has alighted on a plate scented with marjoram oil.

flew at once to the place, where it had last fed, but did not settle down. Then it flew to another plate, evidently seeking first of all the verbenal scent to which it was accustomed. Altogether during five minutes it alighted once on one of the marjoram-scented plates, twice on a second plate with the marjoram scent; but not a single time did it rest on the training plate scented with verbenal oil. Similar experiments were made 44 times. The bees were variously trained to visit a plate scented with verbenal, cedar, geranium, citron, peppermint, etc., while the other three plates were scented respectively with marjoram, myrtle, cherry, fennel, etc. Each experiment lasted 5 minutes. The total number of visits made to the plate with the training scent was 33 times; to one of the plates with a different scent, 73; to the second plate with a different scent, 35; and to the third plate with a contrasting scent, 134 times.

It is proven beyond question that the bees with their antennae removed could no longer distinguish the training scent, but visited the plates indiscriminately, regardless of their odors. In the preceding experiments bees with their antennae intact never failed to visit the scent to which they had been trained. As would be expected in insects, which had lost their sense of smell, the largest number of visits was made to the spot where the training plate had been placed last before the removal of the antennae, although a plate with a different scent was now in its place. The fact that the training plate received the smallest number of visits of the four plates was due to its usually being diagonally opposite to its former place.

**Bees With Their Antennae Intact,
Trained to a Certain Color, Con-
tinue to Behave Normally
to This Color After
the Amputation of
the Antennae**

The bees in the above experiments behaved in a normal manner and not as one would expect, if the amputation of the antennae injured their reaction behavior, as McIndoo asserted. They sought beyond question for the odor to which they had been trained. If it can be shown that bees respond in precisely the same

manner to colors after the cutting off of the antennae, as they did before they were removed, then it is evident that they have suffered no general injury through the operation; but only have lost their organs of smell, in consequence of which their scent reaction fails.

Let us again place upon the table 4 square glass plates, of which three are covered with blue paper and on which are empty glass dishes. The fourth plate is covered with yellow paper, and its glass dish is filled with sugar water (See Fig. 3.) Five bees were trained in the usual manner to visit the yellow paper. At the end of an hour it was evident that the training was sufficient. Four new plates were covered with unused paper (3 with blue paper and 1 with yellow paper) were now laid on the table, care being taken to place the yellow plate in a spot different from that in which the bees had last been fed. On all four plates clean empty dishes were placed.

The bees were again marked with five different colors. During five minutes bee No. 1 alighted 12 times; No. 2, 4 times; No. 3, 2 times; No. 4, 2 times, and No. 5, once; on the yellow plate. Not in a single instance did any of the bees alight on the blue plates.

After a new feeding, bee No. 2 was caught as she settled by the sugar water, and both her antennae, or feelers, cut off at the roots. The other four bees were impounded. On the experiment table four clean glass plates with fresh papers and clean empty dishes were placed. Then the bee deprived of its antennae was set free. She flew at once to the yellow paper, and alighted on it 16 times in the course of five minutes. Again and again she sought the dish on the yellow paper, which up to this time

had been filled with sugar water. Again and again she hovered in the air as though endeavoring to orient herself, and then settled anew on the yellow plate. The blue plates did not receive the least attention.

Thus one bee after another was tested as to its ability to distinguish yellow from blue after the amputation of its antennae. It is not necessary to give the details in each case. In all 22 bees were tested. In a part of the experiments they were trained to yellow, and in a part blue. In not a single instance did a bee without antennae alight on any other than the training color.

Conclusions

From these experiments we may draw the following conclusions: If a bee is trained to a scent, and afterwards both of its antennae cut off at the roots, it is no longer able to distinguish the training odor from other odors, or from scentless objects. But a bee trained to a color flies, after the amputation of its antennae, to the same color, and only to this color. The absence of reaction to the odor cannot be ascribed to an injury to the entire organism, due to the removal of the antennae, but simply to the absence of the organs of smell. Hence the antennae must serve as organs of smell, or to the seat of these organs.

Effect of Cutting Off One Antenna

If, after a bee has been trained to a certain scent, one antenna is cut off, it behaves wholly or nearly the same as when it had both of these organs. Bees were trained to visit a plate scented with cedar oil; the other three plates were scented with myrtle oil. One antenna was then cut off and during three experiments 25 visits were made to the training plate scented with cedar oil; but none was made to the plates with a different odor.

Description of an Antenna

Each antenna, or feeler, of a worker bee consists of 12 joints. The first joint, which is larger and longer than the others, is called the scape, or foot-stalk. The remaining small joints form the flagellum (the Latin word for whip, or lash). The flagellum moves freely on the scape, and the scape itself rises from a universal socket joint in the front of the head. In Fig. 4, S is the scape; 1-11, the flagellum; P, the pore plates; R,

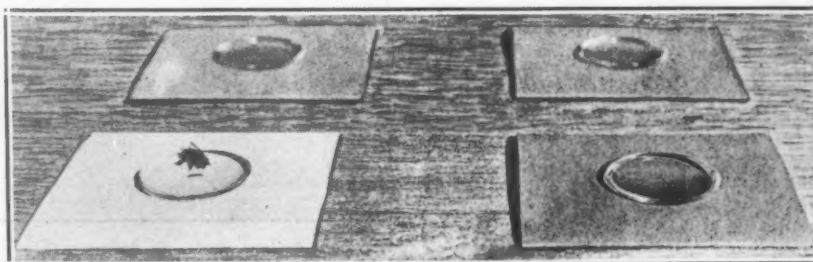


Fig. 3. Control experiment. Three of the glass plates are covered with blue paper and one with yellow paper. Bees trained to the yellow paper continue to visit it after the amputation of their antennae, in whichever corner it was placed.

the olfactory cones; F, the openings or mouths of the flask organs. The numerous touch hairs, which stand between the pore plates, are shown only on the edges. It will be carefully noticed that, except for a few hairs, sense organs are absent from joints 1, 2 and 3 of the flagellum. These three joints are shorter than the others and form an elbow. A nerve runs through the center of each antenna, connecting by nerve fibres with the numerous sense organs. In all male bees the antenna has 13 joints.

Behavior of Bees With a Part of the Joints of Both Antennæ Amputated

If both antennæ are severed in the middle so that only about half of the joints of each remain, the bees behave the same as when one antennæ is amputated at the roots—they are still able to find the odor to which they have been trained.

If 8 joints are cut off from the end of each antennæ so that only 3 joints remain on each flagellum, but these are left intact, then after the operation the bees are unable to distinguish the scent to which they have been trained from other scents, just as when both antennæ or feelers were totally amputated. If only two or one joint are left on each flagellum, the bees behave in the same way. They can no longer orient themselves by odor. As is shown in the figure of an antenna, there are no organs of smell on the first three joints of the flagella. Sixty-one experiments were made, in which only 1, 2 or 3 joints were left on each flagellum. The total number of visits made to the plate with the training scent was 125, and on an average 134 visits were made to each of the plates with a different scent. Evidently the bees had lost their olfactory organs, and were no longer able to distinguish between the different odors.

If the ends of both antennæ are cut off so that there remains on one flagellum 4 joints, and on the other 3 or fewer joints, the bees continue to recognize the training scent with a certainty which leaves nothing to be desired. Also they can be trained to recognize a new odor. Immediately after an operation in which only four joints are left on each flagellum the bees exhibit a certain amount of indecision and make more or less mistakes. This cannot excite surprise, since suddenly the sense organs on the antennæ have been reduced to a small fragment. But even now, as often happens, their activity in gathering sugar-water manifests itself strongly, and later becomes proof against the opposition scent. Thus it appears that with only a sparse fragment of their organs of smell remaining they have learned to distinguish as certainly the training scent as do bees with both antennæ intact. Bees, which had only the fourth joint of the fla-

gellum on one side, seemed somewhat more uncertain than those which had this joint on both sides, nevertheless they still found the training scent in an unquestionable way. But they did this easily only when the scent was freshly put on the plate in each experiment. If the plates were not intensely scented, then the bees made more mistakes. Thirteen experiments were made with bees which had four joints left on each flagellum; 83 visits were made to the training scent and only 15 visits to the three other plates which had a different scent. Eighteen experiments were made with bees which had four joints on one flagellum and fewer joints on the other flagellum; 123 visits were made to the training scent and 39 visits to the three plates which had a different scent. Three times were bees, which had been trained to a scent and then operated

on so that on one flagellum there was only three or less joints and on the other five joints, trained on their return the following day to another scent. In five experiments they alighted 52 times on the plate with the new training scent, and on the plates with different scents altogether only five times.

Conclusions

It has been conclusively shown by the facts presented above that a bee from which 15 antennal joints have been amputated (8 joints from the end of one antenna and 7 from the end of the other), so that on one flagellum only 3 joints and on the other only 4 joints remain, can still, in an indubitable way, distinguish between odors, and can also be trained to a new odor. On the other hand a bee from the antennæ of which 16 joints have been cut, so that on each flagellum only 3 joints remain, can no longer recognize the old training scent, and, moreover, cannot be trained to a new scent. The sense organs, which act as organs of smell are absent from the first three joints of the flagella, but are present on the fourth and the following joints. These experimental conclusions agree with the greatest exactitude with the results of microscopical investigations. There is no evidence that the amputation of 16 joints causes a severe shock, while the amputation of 15 joints does not. It is thus established anew by these investigations that the organs of smell are located on the antennæ.

If there are organs of smell on other parts of the body, they are so few that their significance is wholly placed in the shade by the organs of smell on a single antenna joint. This is possible, but the more probable conclusion is that the olfactory organs of the bees are exclusively on the antennæ.

Waldoboro, Maine.

A Good Selling Idea

Mr. Karl E. Killion, of Paris, Illinois, writes that he keeps his bees in the Modified Dadant hives and has secured as high as 156 pounds per colony on an average, with single colonies producing as much as 300 pounds.

One of the advertising stunts which he tried with success was to visit a nearby coal mine and letter a sign with chalk on the ends of about half a dozen of the little coal cars which carry the coal from the mine to the loading station. This little reminder of honey to the hungry miner at about the noon hour sold several hundred pounds of his honey very promptly. Sometimes it is the least expensive advertising which proves most successful. The lettering on the ends of the little cars, where it would be seen by the loaders at work in the mine, took but a few minutes' time and cost nothing, but it served to bring his message to the men at a time when there was little to distract their attention.

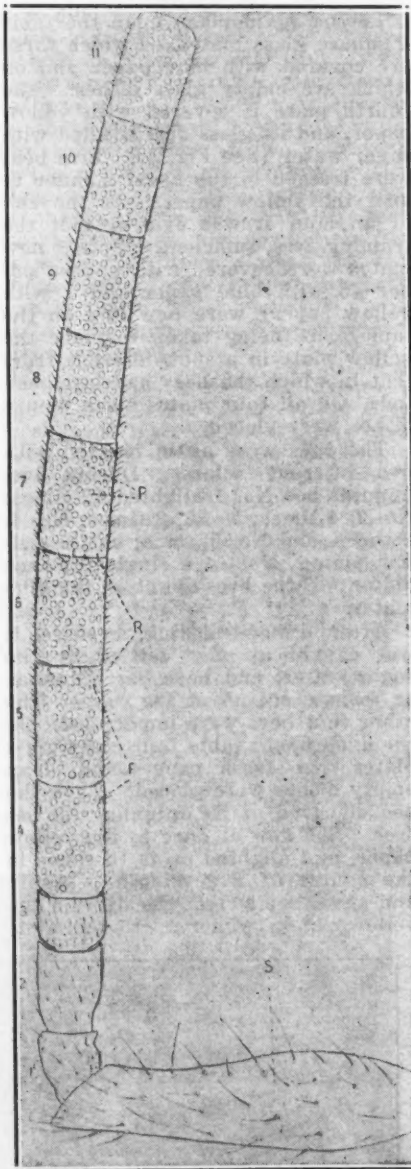


Fig. 4. An antenna. S, scape; 1-11, flagellum; P, pore plates; R, olfactory organs; F, mouths of flask organs. There are no organs of smell on the first three joints of the flagellum (the first four of the antenna).

FEEDING BEES AND BEE FEEDERS ✓

By G. C. Greiner.

DURING almost a lifetime of bee-keeping my experience of feeding bees has run in different channels, in regard to object of feeding as well as to the means and appliances used for that purpose. I can say that during all these years I have been very fortunately located in as much that feeding to prevent starvation was with me seldom necessary.

Many years ago, in the earlier days of my beekeeping career, I think it was in the early eighties, I was surprised one spring morning to notice scattering colonies in my yard having an unusual number of bees with fluttering wings, moving in seemingly weak condition, about the entrance of their hives. What this meant I did not know at that time, but found on examination that nearly all my bees, about 75 colonies, were on the verge of starvation. Although being young at the business, I knew well enough that only immediate help would save my bees.

Being destitute of proper feeding appliances, I resorted to the speediest and most convenient feeding method that offered itself to my inexperienced mind. I raised the front of all the hives of the starving colonies slightly above the level and poured from a can with spout diluted honey into the entrance. This incident happened so long ago that I do not remember all the exact details of my operations, but to prevent robbing I did this feeding evenings and fed no more than each colony would clean up by the next morning. Besides, keeping the entrances well reduced day times, I experienced no trouble with robbers. The hives, being level sideways, distributed the feed in a thin layer over the back part of the bottom-board, so that no bees were drowned or besmeared when helping themselves to the honey, at least everything was cleaned up in the morning.

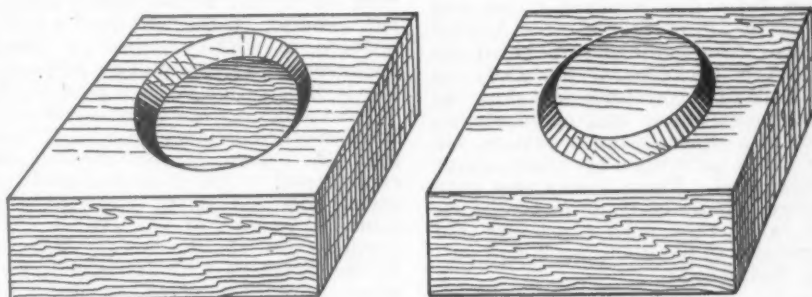
In the course of years I have tried and used almost all the bee feeders that were ever advertised or mentioned in our bee periodicals and always improved them whenever there was a chance to make them more convenient. When I made it a practice of finishing sections by feeding diluted or unripe extracted honey (I am doing this yet in a small way) I used the so-called Miller feeder, but improved it to give better service. I use this same feeder now when I have any occasion for it, that is, if feeding in large quantities is desirable. But for stimulative feeding, to draw out foundation or for brood-rearing, I use a small tin can suction feeder, provided with an arrangement of my own invention, which I think is one of the best time-savers I have among my beekeeping outfit.

The friction top honey pail, set d'-

rectly on the main frames, as mentioned occasionally by our bee papers, I have used now and then, but it always annoyed me; covering the hive and making it bee-tight with blankets when first installed is an inconvenient, unpleasant job which becomes a waste of time when repeated refilling is necessary. I did not object to its use before, because I had but little feeding to do, but since I handle package bees regularly every spring, that requires daily feeding

This little appliance is indeed a small affair, but it is a pleasure to use it; not a bee will interrupt the operator, neither does the operator disturb the bees, and a whole row can be fed up in less time than it takes to tell it. This, of course, applies to unpacked bees, with simply a deep cover over the feeder. However, during cold spells or cool nights it is advisable to protect the feeder and inner cover with blankets. A little time expended in this direction may prove a good investment.

Years ago, before the much-dreaded disease, American and European foulbrood, made its appearance, I always reserved some of my best



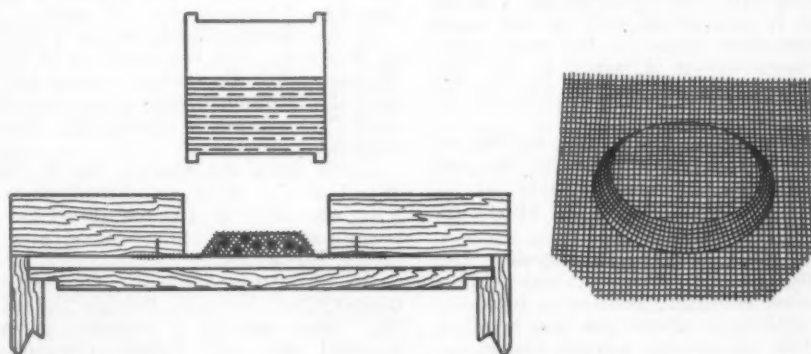
Positive and negative blocks for stamping out screens.

for an indefinite length of time, I need a feeder that answers the purpose with the least outlay of time, and I think the hereafter described implement answers this purpose admirably.

The inner hive cover, or material of a similar kind, has in the center a hole to fit the friction top can to be used as the feeder, bee-tight, but loose enough to be moved back and forth easily. A piece of common window wire screen, with a raised inset to fit into the depression of the friction top is nailed on the under side of the cover over the hole. I use a 1-pound Crisco can with a dozen or two of small nail holes punctured into the cover for this purpose. The whole apparatus is so simple it hardly needs a description; but to make it a little plainer, a cross section and the little screen inset is given. This inset is easily made with a couple of wooden blocks, positive and negative. A blow or two with the hammer will produce it.

white honey, which I selected from my extracting stock, for feeding purposes. The use of combs of honey is the most convenient method of supplying stores to needy colonies; it saves much time and trouble, that sugar feeding imposes upon the beekeeper. But since that disease became such a general country's scourge, I have changed my tactics in this respect. I now extract all my honey for the market and feed sugar syrup in its place. The financial part of the procedure remains about the same; what the honey brings in market buys the sugar we feed. By doing so, we eliminate all possible chance of transmitting the disease, for we cannot tell which drop of honey is infected and will start the disease anew among our bees. If we, then, as a precautionary measure, use only sheets of foundation with our package bees, we are quite sure that our bees, for one season at least, will be free from infection.

New York.



Details of Greiner's bee feeder.

HOW CHAIN AND DEPARTMENT STORES FEATURE HONEY.

A Glimpse of the Advertising Space Used and Some of the Prices Secured in Various Cities.

By Wallace Piper.

WHAT attention do stores give to advertising honey? When and how do they feature it? What prices do they get for it?

These were some of the questions which I set out to answer in a survey of about six hundred newspapers covering fully five hundred cities and towns in all parts of the United States. The findings may be of interest to beekeepers, especially as the bulk of advertising was done by department stores and chain stores, who, in a sense, make a pattern for the retail activities of other stores selling food. These stores also have a large volume of trade in foodstuffs and, when they push a product, aid materially in popularizing it and getting distribution.

In this three month's survey, one of the most active stores was Hillman's department store of Chicago. Honey was advertised as a leader to its Cash and Carry Market in the basement; none would be delivered. There is a significance in the varying amount of space given to a product by a department store. It means something if an item is given only two or three lines of type or played up with a couple of inches and an illustration.

Just before Thanksgiving, Hillman's used two inches for an illustration of a pail of honey branded "Pure Honey, Hillman." It was advertised as absolutely pure clover honey in 5-pound tin pails, \$1.50 value, at \$1.05.

Early in December it was given an inch of space, the same price being maintained. In the middle of January the item was back as a leader with 2½ inches of space, the 5-pound pail being offered at 87 cents and described as "extra fancy, absolutely pure honey, from the Superior Honey Company, packed by us, 12 cans delivered." A week later it was "spot-lighted" at 92 cents for a 5-pound pail. By spot-lighted, I mean that it was given one of the most conspicuous places in the store's advertisement—in a panel at the left of the firm's heading at the top of the page.

Also, along about the middle of January this firm was giving two and three lines to 24-ounce jars at 29 cents of "absolutely pure clover or orange blossom honey."

A week before Thanksgiving, the Boston Store, Chicago, was giving another spotlight position to honey—advertising it above the firm heading at the top of the advertisement, as follows: "Pure strained honey, ex-

tra fine, Colorado, pail net weight 5 pounds, 98 cents."

Early in December, the Boston Store was giving strained honey another prominent place—a 3-inch space at the lower left hand corner of its advertising. It had a panel with an artistic border and a special cut heading, with "strained honey" lettered in white against a black background. There was an inch-and-a-half illustration of a 5-pound pail of "None-Such Pure Strained Honey, Durand-McNeil-Horner Co." It was specially priced for one day at 98 cents a pail. This store featured the same thing and at the same price in a limited number of specials for "Everything for the New Year Feast." In the latter part of January it was given prominent place, in a 3-inch panel, in the first column of the advertisement, being described as "None-Such Brand Fancy Pure White Alfalfa and Orange Blossom Honey, none finer."

The middle of January, the Adolph Market Co., Chicago, was making a special of pure white clover honey, quart jars, net weight three pounds, at 55 cents.

For the Thanksgiving trade, the Piggly Wiggly chain stores made a special of Airline Honey, in 8-ounce jars, at 19 cents. In the middle of February, the Piggly Wiggly stores in Vicksburg, Miss., were featuring 8-ounce jars of Airline at 22 cents, 14-ounce jars at 34 cents, and 2-pound jars at 69 cents.

For the Christmas trade, the Kroger, chain of stores in Cincinnati listed "Honey, absolutely pure, pound jar 23 cents." The same chain made the same special offer in Richmond, Ind.

In Cleveland, Ohio, the Fisher Bros. Co. Stores were making a special in the middle of February upon "New Comb Honey, Fancy New York State, section 30 cents," and "Pure Extracted Honey and Finest Orange Blossom, 11 ounce jar, 17 cents."

In San Diego, Calif., in the middle of February, the ten markets of the Waite-Shaffer Co. were running as a special, "Honey, white sage, jar 22 cents," without specifying the weight.

Aside from the chains, the V. W. Wood & Co. store, of Birmingham, Ala., was offering, the middle of February, a 1-gallon can of strained honey for \$1.90.

At Christmas time the Okanagan Grocery, of Vernon, British Columbia, was making a feature of a 4-pound tin of British Columbia honey at 90 cents.

One drug store was found pushing honey. Sullivan & Slauson Co., of Utica, N. Y., used as a dollar day special, "Four one-pound jars of pure strained honey for \$1.00."

If honey is getting much separate advertising, it did not appear to any great extent in these papers. The sole instance noted was in Greensboro, N. C., where Patterson Bros., Incorporated, a department food store, used a 3-inch space to advertise, "Delicious Comb Honey—honey is packed in 5 and 10-pound boxes, bright and delicious flavor." The special price for two days was \$1.25 for 5 pounds and \$2.50 for 10 pounds.

These prices and the fact that honey is nearly always featured as a bargain when it is called to the attention of the consumers, indicate what the buyers expect when they buy honey. This does not mean that a good brand of honey attractively displayed and recommended by the grocer will not sell steadily at a steady price, but it does show that a great deal of honey is being marketed without emphasizing any particular brand.

A Possibility of Intensive Culture

It is possible, indeed it is quite likely, that, with the increasingly artificial conditions of modern beekeeping some fell plague may arise from some corner of the world and wipe out all the bees of our apiaries. That was very nearly done by the recent ravages of the Isle-of-Wight, in the British Isles, disease. This made wide areas beeless and whole countries all but denuded. It has required considerable Government assistance and wholesale importations from abroad to restore bee life to our gardens. It is not a wild flight of fancy to imagine that with the increasing intensive culture of bees some disease may arrive, a minor ailment it may be, in the Himalayas or on the tablelands of Thibet, but becoming a raging pestilence by the time it reaches Europe or America, sweeping destitute its apiaries and leaving only those vagrant half wild bees of roof tiles and tree trunks.

England.

(We do not agree with these mournful views. Diseases of bees, like the plagues of the human race, have existed from time immemorial. We no longer see plagues like that of London, so interestingly described in Pepy's Diary. Neither have we heard for centuries of the plague of Florence. Foulbrood was described by Aristotle, by Schirach, by Della Rocca. But what is near us always looms up greater, larger, more stupendous than what is far away. We keep our bees better; we produce more honey; we have more bees; therefore more chance of spreading diseases. But we are learning how to overcome the diseases, and the microscope is showing us things that men like Aristotle could not find out. We are not going backward, but forward.—Editor.)

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

A QUEER CASE

I am writing to ask you if you can explain the actions of this colony or bees. About three weeks ago they cast a swarm which was promptly hived and an examination of the parent colony four days later showed that they were in a prosperous condition, 8 pounds of brood and a super of sections about half full. I might add that I was out of town when this occurred and the examination of the colony took place upon my arrival home. About a week ago I began to notice that they were bringing from the hive a large amount of cappings and an inspection showed that they were gnawing down the cells to the mid-rib, apparently as fast as the bees hatched, and in some cases before, as the board in front of the hive was littered with dead pupae. These depredations have continued ever since and are still going on, although the queen has hatched, appears normal, and is laying on the extreme side of the hive. In the center of the hive the combs are gnawed on both sides so that only the mid-rib remains, and on the other sides only the combs towards the center. I might add that in all the combs the cells adjoining the top bars contain three or four rows of honey and these remain intact, save that they have been uncapped, as have also some of the combs in the sections.

The case is so exceptional with me that I would be glad, if you have ever seen such an instance, to hear from you in regard to it.

I am watching this colony with interest and am wondering what they intend, finally, to do.

The flow of nectar is easing up quite perceptibly, although the stronger colonies are still storing quite a bit. I mention this as it may have a bearing on the case. The weather has been exceptionally fine, but not too hot; but it is getting very dry. The tobacco growers in the Connecticut Valley predict a 20 per cent crop, only, this year, and the Weather Bureau announces this is the driest July since 1871. It is certainly the driest summer I remember in a long time, and doesn't promise much for a clover crop next year.

CONNECTICUT.

Answer.—I acknowledge that I have never heard of a case like this. If the larvae were diseased and the pupae dead which they are throwing out, we would have to conclude that it was some corruption of the cell walls that caused the bees to cut them down. As you report the matter, there is no satisfactory explanation that I can give.

Our weather is very queer this summer. We have a great deal of cool weather, lots of cloudy days and considerable rain. The bees have made very irregular harvests, and, strange to say, have been prone to swarm without being crowded in any way. It is an extraordinary season in every particular.

Perhaps some of our readers may be able to throw some light on your trouble.

WINTER PACKING, ETC.

1. I am just a beginner in the bee business, and I am getting so I don't want to do anything else. I have my greatest trouble in wintering. Last fall I had 20 colonies all strong with plenty of stores except one rather weak. I packed 17, 8 in oats and 9 in leaves, about the last of October, and I only have 9 left of them, with 2 of them weak. I had 13 left, but the other 4 were too weak, so I united them. They had lots of honey, mostly gathered in the fall. The hives were like a person had mixed mud and water and dumped on the frames in some hives where they died. Do you suppose it was poor honey, or what do you

think of it? There was plenty of honey left in all hives.

2. One thing I do know is bad for them: I have them out in the open where all winds get at them and I unpacked them too early, about the 12th of April.

3 I will also ask you which you find the safest way to introduce queens even if it be extra work until I get more practice, as I have tried my best and followed directions on cages, but have poor success.

4 I would also like to know if you know of any bait to put on or in hives or boxes to catch outside or strange swarms I have quite a few drawn combs.

5. I am also looking for a place that would be suited for an apiary. I would like to buy a small place with bees on, if I can, a place that would also be suited for poultry and fruit or a little dairying or, if I could, rent a small place in a good location. What do you think of the cut-over lands in Wisconsin and Minnesota? If you have any such place in mind, please let me know, or if you hear of any later, as I would want one to take possession of this coming winter or spring.

6. Which do you consider the best, timber country or prairie country, for bees?

IOWA.

Answers.—1. I believe the answer to your first question is in the words "honey gathered in the fall." Not that honey gathered in the fall is always bad, but it is often unripe and often contains too much floating pollen in it. The remedy is to extract it, when you are in doubt about it and feed some sugar syrup. It is not necessary to extract it all, but only that in the center combs or that which is unsealed at the end of the crop. The "mixed mud and water" you mention is a sample of the diarrhea, which causes the trouble.

2. Yes, it is bad to have the hives in the open. They ought to be in shelter. But when they have bad honey, they suffer even in the cellar, when they are long confined.

3. The best method we know of for introducing queens is that given at the foot of page 222 of the May American Bee Journal. If you follow directions given, you will rarely lose a queen.

4 There is no particular bait to use to attract swarms to a hive, but if the hive has some combs in it and is clean, and placed fairly high, not down in the grass, there is some chance of a swarm going into it. But I would not rely upon that to get bees, for there is nothing sure about it.

5. I do not know of any place, but you ought to be able to find a good location for beekeeping in the cut-over lands that you mention, if you are not afraid of work and of living some distance from a city.

6. There are good locations both near timber and prairie lands. But a location where there is both prairie and woods seems to me to be best. Better select the state where you wish to live and then look up a location by going around.

HONEY GRANULATING

I am alarmed, as a day or two ago we extracted some combs that were taken off the hives a month or two ago and found some of it beginning to granulate. This honey has been here in our kitchen all the time and I was afraid it might sour; but was amazed to find it granulating. It is made from alfalfa and wild flowers. The wild

flowers seem to be mostly wild roses and larkspur.

Altitude here is 4,700 feet. Last winter was my first with bees: I put them in a nice dry cellar (cave) where the temperature was from 45 to 48, excepting a very few days, when it was part of the time as low as 42. The honey nearly all granulated and some of the bees perished.

Now is it necessary to take all the honey away from the bees and give them sugar syrup for winter? And if so will it be safe to do so after I receive a reply from this inquiry? Any suggestions or advice along this line will be very gratefully received.

WYOMING.

Answer.—As I have very little experience with alfalfa honey, I referred this enquiry to Mr. Frank Rauchfuss, of Denver, who has probably handled more alfalfa honey than anyone else. Here is a part of his reply:

"We have handled the Powell district honey for years, and are handling a large quantity out of that district this year, and in our experience with alfalfa honey produced in high altitudes, such as Wyoming, Colorado, Nevada and Utah, we find that it is not going to granulate soon, if left in the combs where the bees stored it. We have had alfalfa comb honey stored for several years with very little granulation. We can even cite one case on display at the Colorado State Capitol for seven years which did not show any granulation.

"If your honey that the bees stored in the combs is granulating, I am of the opinion that a good portion of this honey has been gathered from other sources. There may be some mint honey in it and that might be the cause of the trouble. At any rate, if we were in your situation, in order that the bees might winter safely, we would feed them some sugar syrup. If the syrup is put up according to instructions given from time to time in the Journal it will stay liquid; but you must get right out after this, since there is no telling when winter may set in with you."

Mr. Rauchfuss' advice is good. There is no need of removing the honey, whether granulated or not. Feed 10 pounds of sugar syrup per colony. This will be used first, and when spring comes the bees will have no trouble in using that granulated honey. We have often fed granulated honey to bees in spring and they manage to use it up, for they can get all the water they want at that time, to help liquefy it.

WINTERING

I have my bees in an empty dry goods box packed solid with last year's forest leaves all around the hive. The bees fly out when it gets warm and when it turns cool they stay in and feed on some syrup, made of two-thirds sugar and one-third water. I made holes in an empty honey pail lid with a small nail, and when I turned the pail upside down the syrup seemed to run too fast. Was it not too thin? I think my bees have enough honey stored for the winter, but I will put some sugar syrup and candy in an empty super above the hive. Please let me know how to make sugar syrup and candy.

ILLINOIS

Answer.—Your packing of the bees is all right, as you describe it. As to the sugar water running out too fast through those nail holes, it is a fact that it runs too fast at first, but when it remains overturned, the atmospheric pressure prevents it from running unless the holes are big enough to enable the air to gurgles through those holes. When we use what is called an atmospheric feeder, we turn it over on a dish until the pressure begins to act, usually after a few tablespoonfuls have run out. Instead of punching holes in the lid, we sometimes use a cloth tied over the mouth of the can and overturn it the same way on a dish before



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Untested Queens, \$1.00; 6, \$5.00; 12,
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J. P. MOORE, QUEEN BREEDER
Route 1, Morgan, Kentucky

feeding. You must, of course, be sure that
the can does not leak, because the air
could come in through the leak.

To make sugar syrup, dissolve 20 pounds
of sugar in a gallon of boiling water. Use
the best grade of sugar and add 5 or 6
pound of your own honey, that you know to
be healthy. If you have no honey, add a
teaspoonful of tartaric acid, to keep the
food from granulating.

To make candy: Add water to sugar and
boil slowly until enough of the water is
evaporated. Stir constantly. To know when
it is done, dip your finger in cold water
and then in the syrup. If what adheres to
the finger is brittle to the teeth it is done.
Anyone who can make "fudge" can make
candy for you.

TAKING UNSEALED HONEY

1. There will be quite a lot of unsealed
honey to take off. Do you think that it
will be all right to let that go with the
sealed honey; it's been on the hive quite a
while now, and no new honey coming in, so
I figure it ought to be as good as any? I
expect I'll have my troubles, as it will
probably be pretty thick and hard to ex-
tract.

2. I have about 12 pounds of Hubam clo-
ver seed that is about 2 years old. (The new
annual). Do you think it would be too old
to grow well? Would it be best to sow
it this fall if I can get to it, or save it till
spring? It is unhulled.

3. I have had a lot of trouble with the
bees getting after the horses, when I work
near them. Do you think it would be all
right to shut them up for a day or two at
a time? Say block the entrance and take
the cover off and put on a screen wire to
give them air, same as if you were going
to ship them or move them?

NORTH MICHIGAN.

Answers.—1. Unless the weather has
been very damp lately it is quite probable
that your unsealed honey is as ripe as that
which was sealed. It is easy to see when
you extract. I do not believe there is much
doubt about it. It is only the fresh un-
sealed honey which is likely to give trouble.

2. Usually the sweet clover seed that has
been drying is very hard to germinate. I
would not say that it has lost its value,
but it would not be a bad idea to sow it
before winter and let it stand in the field.
That may soften the hull and outer coat so
that it may germinate. If you don't see it
coming in the spring you may use fresh
seed.

3. I don't like the idea of shutting up the
hives, even with plenty of air, for days at
a time. You will lose more or less of them.
I would prefer moving them to some spot
where they will be less dangerous for the
horses. Perhaps, if you can make sure of
which hives have the cross bees, you may
change their temper by changing their
queen. It has always worked with me.

WINTERING IN PIT

I have only 2 hives of bees; am planning
to dig a hole in a side hill about 5 feet
square and 8 or 10 feet deep, put the hives
in three tiers and cover with about 6 feet
of sawdust and straw; run a 4x4 in. ven-
tilator to bottom of pit through which I
can lower a thermometer during winter and
observe temperature. The subsoil is sand.
Our house cellar is too cold, about 32 de-
grees most of the time.

Will above plan be safe? WISCONSIN.

Answer.—Yes, I believe the plan will be
safe. When I was 15 to 18, I helped my
father to put bees into a silo, and we did
it several winters in succession and suc-
ceeded well, as they were below frost and
probably kept a fairly constant temperature.
But the soil was clay, and one winter there
was so much rain that the ground did not
freeze and, although the silo was supposed

to drain, there was so much moisture that
the combs moulded and many of the colo-
nies died. This ended our silo experience.

In your case, since the soil is sandy, it is
quite probable that you would not have the
same trouble, especially as your climate is
colder than that of central Illinois. So I
would not be afraid to try it.

HONEY PRICES—HONEY ON SHARES

1. How much should one receive per
pound for extracting honey, at home, and
how much more per pound when they take
their machine to a place to extract? What
is a fair price? Who gets the cappings and
drippings in such a case?

2. If one is going to work bees on shares,
what is the best way? If I furnish all the
sections, foundation, and do all the work,
what percentage should I receive? These
hives are ten-frame. Would it be better
to run them for extracted honey?

3. One large producer here says he pre-
fers eight-frame hives to the ten-frame for
comb honey, and although I have never used
ten-frames, I have had good success as a
comb honey producer with the eights. How-
ever, the ten-frames seem to be the univer-
sal cry now. I intend to increase heavily
for a few seasons. Had I better purchase
ten-frame hives? MICHIGAN.

Answers.—1. If they bring you the combs
of honey to extract and you only do the
work of extracting, for a share, you can
make good wages on a small lot, say 500
pounds, by charging one cent per pound, or
one-tenth of the honey. If you go to the
apiary and do all the work, putting the
combs back on the hive afterwards, it is
worth about twice as much. The cappings
and drippings belong to the owner of the
honey, unless otherwise arranged.

2. If you take care of the bees of an-
other man, do all the work and furnish all
the sections, foundation, hives for swarms,
you should get half of the swarms and half
of the honey, the other man paying you for
the foundation used in his share.

3. We use a hive larger than either the
8 or 10-frame Langstroth; but we produce
mainly extracted honey. We would use it
for comb honey too; but if you use Dr.
Miller's method you can succeed very well
with 8-frame hives. For extracted honey,
even the 10-frame hives are not large
enough after you have tried the larger
hives.

FEEDING

I have several stands of bees that I am
going to have to feed this winter, owing to
poor production.

Would you be kind enough to write me in
detail just what to feed them? Also how I
should feed them—that is, in what kind of
containers, and where I can purchase these.
ARKANSAS.

Answer.—Feeders of all kinds are made.
Any open tin can, with a perforated lid, in-
verted over the combs, is good. You may
even use a cloth tied over the mouth of the
can, for a cover. Inverting this on a dish
first, to gather the first flow of liquid, is
good, as it leaks but little after the atmos-
pheric pressure begins to act. Feeders are
sold by all dealers. Our people offer them
on page 28 of their catalog.

For feeding, prepare a mixture of 20
pounds of sugar and 10 pounds of water,
Melt thoroughly and add either a teaspoon-
ful of tartaric acid or a pound of honey,
to prevent crystallizing. This should be
fed over the cluster before cold weather. Be
sure and feed enough that you do not lose
your bees by starvation after having
brought them through the winter. We
figure that it takes no less than 30 pounds
of food to bring them to the first blossoms
of spring. Even then you must keep close
watch of them.

FOULBROOD AND BEE TREES

By C. D. Adams, Chief Apiary Inspector, Wisconsin.

For several years I have been speaking at local beekeepers' associations in Wisconsin. In a large majority of these meetings when the subject of American foulbrood was being discussed one of the first objections to the area clean-up is that it is useless to attempt to clean up as long as there are bee trees in the community. I believe this is an almost universal opinion and it would seem there must be some truth in the surmise. But after having assisted in every bee tree cutting I ever had an opportunity to attend and for years having made it a point to question every man that I heard mention bee trees, in meetings and out, I have come to the conclusion that it is almost a negligible factor in the spread of bee disease.

In the first place, I have found that it is often used as an excuse for neglect of one's yard. One of my friends, for one reason or another, had been among the last to clean up in his neighborhood. His father had been a beekeeper on the same farm for 40 years and from all accounts an unusually good one. The son was following in his footsteps—or at least in some of them, but when I urged him not to be the last in his county to clean up, he replied: "What is the use? It comes right back from the bee trees as fast as I get rid of it." I asked him why he did not cut the bee trees. He replied that he did not know where they were, and then, to my surprise, admitted that he had never seen a bee tree, but he knew there must be lots of them, for dozens of his swarms got away.

Of course, such evidence was of no value one way or the other. But the next case submitted almost clinched the argument with me. I was talking with an old beekeeper, in one of our best known honey producing districts, that for years had been a hotbed for bee disease. This beekeeper had been hard hit at one time but under the direction of our veteran, but still active, inspector, N. E. France, had cleaned up. So I knew he was well acquainted with bee diseases, and when he remarked that he and his brother had kept count of the bee trees they had cut and they numbered over 100 I immediately became interested. "How many of them had foulbrood?" I asked. "Just one," he replied. Incidentally I might remark that while that is still a beekeeping section and still quite heavily timbered, our records show that only one apiary in that part of the county has American foulbrood.

Such evidence was a puzzle to me. Why are bees in trees apparently almost immune to foulbrood? After talking it over with many of my friends I submit the following facts as a partial explanation:

Colonies of bees badly affected seldom or never swarm, of course, but some do swarm while the disease is

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in its early stages. These swarms carry the disease with them in the honey sacks but not on the hairs of their bodies as is often supposed. When they find a cavity in which to begin housekeeping there is no comb for them to deposit their honey in. They use it up in constructing comb and for their own nourishment before there is any brood to feed. So the bees have automatically given themselves the "shaking treatment" without any of the dangers of scattering the infection as is too often done by clumsy man.

Some may say that they sometimes find a home in a cavity that had a former tenant that died of the disease. Nature seems to have pretty well provided against this calamity. Mice, squirrels, and possibly other animals apparently destroy all comb soon after a colony dies or swarms out.

But this by no means disposes of the question. One of the most common ways of scattering the disease is by robbing, and bees in bee trees have not lost any of their bee nature. So they may rob and acquire the malady, and I am inclined to believe they do in rare cases. Why is it not common? I can only suggest a few possible reasons. I believe I am correct in the assertion that in most cases it is the after-swarm and not the prime swarm that escapes to the woods. The beekeeper usually is watching for the early swarms but becomes careless later. These late swarms seldom store enough honey to survive the winter and certainly do not become strong enough to go out to rob the first season.

Again, comparatively few of the escaping swarms find suitable homes. In fact, it appears that comparatively few of them find any at all, but once in a long while a good swarm does find a good home, and becomes strong enough to go out and rob. But are isolated bees in the trees as prone to rob as bees in yards where the owner is often the unintentional cause of robbing being started? Who knows?

There is still another comforting thought in the robbing problem that affects apiaries as well as bees in trees. **Bees seldom go more than a mile to rob.** Evidence to substantiate this began to accumulate in our area clean-up work, four of five years ago, and our inspectors were asked to report all evidence for and against the proposition. To our surprise nearly all the evidence was "for." Space does not permit me to give instances, but we have many incontrovertible proofs that certain large yards remained free of the disease within a mile of yards badly infected and carelessly kept.

On the other hand, two, and only two, well known beekeepers submitted apparently, but not to me absolutely, conclusive evidence that bees had gone greater distances. One of these submitted by N. E. France, in 1922, appeared to show that bees on the Wisconsin side of the Mississippi

River went three miles across the river and robbed a badly infected bee yard. This much is sure. There was such a yard across the river and Mr. France standing in the Wisconsin yard detected robbers going and coming from the direction of the infected yard. Later American foulbrood appeared in the yard in question. My only question was: "Are you positive there were no bee trees on the numerous islands that our friend's bees were robbing?" Well, bee trees seldom have foulbrood, so I think this was about as good proof as we could ask, but it certainly was an exception.

Here is where I have to confess that I am not contributing anything new to the question of the distance bees go to rob. Just when I thought Wisconsin bee inspectors had something new to add to our knowledge of bees, I read Quinby again and that spoiled it all. On page 283 of his "Mysteries of Beekeeping," first published in 1853, he says: "The greatest distance I ever knew bees to go and plunder a defenseless stock of its contents was three-fourths of a mile. Very likely they will go further on some occasions, but not often." This is found in his chapter on bee diseases and is one of several important facts that have been rediscovered in recent years.

While our department does not consider the bee tree a serious menace in our area clean-up work, nevertheless we class it with the hive with immovable frames, and where found require it to be cut in the presence of the inspector. This may seem inconsistent, but we believe in "Safety First."

(We do not believe it is good policy to allow bee trees to remain, in the vicinity of an apiary, anyhow. They should be hunted out and destroyed.—Editor).

HONEY AS A REMEDY

By Dr. Frances Scott Taft.

Into a glass of warm raw milk, stir one tablespoonful of honey, drinking one glassful four times a day, the last being upon retiring. It is one of the finest of remedies for any form of bronchial or anemic distresses.

Plain comb honey beats the world for correcting constipation; to be eaten with whole wheat, or bran bread at least once a day, oftener if desired.

Extracted honey, mixed with lemon juice, is a wonderful corrective for irritated epidermis-tan, freckles, sunburn, and is especially good for chafed skin peculiar to young babies.

Candied honey could be pressed into small squares and sold in cartons for ten cents a piece, to be eaten instead of confections, while traveling. It's the purest candy in the world and the very best for children.

Mix one-fourth of a teaspoonful of capsicum to one pound of candied honey for an aggravated cough caused by a severe cold. Take as needed.

Portland, Ore.

HONEY TONIC—AND BEARS

A Combination That Brought Prosperity to the Owner of A New England "Abandoned Farm"

By Margaret A. Bartlett.

HONEY TONIC—for bears: That is one of the many things Fred Buck, hustling owner of what, a few years ago, was a typical run-down New England farm, dispenses to automobilists who draw up alongside the modern filling station which now occupies the site of the tumbledown barn that originally "went with" the place.

Now, it isn't often that one encounters a modern filling station out in the country. But, for that matter, it isn't often one finds bears running a filling station, dispensing gasoline, etc., to patrons, and guzzling bottle after bottle of **HONEY TONIC** made especially for them, and readily bought by car drivers for the sake of the amusement they get out of seeing the bears take their drink and cry like babies for more.

Behind such an unique situation there must be—and is—a story. Some five years ago, Fred Buck bought an old, worn-out farm on the Boston Post road out from Northboro, Mass. The farm had possibilities—but it was going to take a long time to develop them. Practically every inch of the ground needed to be "brought back." However, he did get, that first year, a wonderful crop of beans—Kentucky Wonders. But so, it seemed, did everyone else in Northboro. He tried to sell them at the farm for 4 cents under the town price—but he only sat on a bench and watched car after car shoot by.

But one day he had companions on the bench—his two well-trained bear cubs that he had purchased from a friend in Northern New Hampshire soon after he had bought his farm. Teddy and Peter had picked beans for him; now they were trying to help him sell them. And they succeeded. A motorist stopped—and bought one quart of beans, at six cents! He admitted, however, that he didn't care anything for the beans—that he merely bought them to get a "close-up" of the bears.

That gave Mr. Buck an idea. He decided to let Peter and Teddy sell the beans. And Peter and Teddy did! Who wouldn't buy beans for the sake of being waited on by a pair of frolicsome bears?

Occasionally a motorist discovered that he was short of "gas." "Could I get a gallon to get me into town?" became a frequent question. Mr. Buck began to keep a little stock of gasoline on hand for such emergencies. He trained Peter and Teddy to pour the gas out of the five-gallon can. Motorists not running short would stop and ask for a gallon for the novelty of having their tank filled by bears.

It wasn't long before Fred Buck installed a pump. And now he has a modern filling station. Of course he

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HERMAN McCONNELL

(The Bee and Honey Man)

Robinson, Illinois

runs it, but the bears do all they can to help, and they certainly do draw folks there.

And when folks are being amused by animals they always want to feed them, either as a reward for the free entertainment they give, or else for the additional fun of seeing them eat

and beg for more. Honey is the sweetest word in the world to a bear, but honey cannot be bought in a bag and tossed into cages, like peanuts. Diluted with water and put up in tonic bottles it can be sold to those who want to delight their bear friends—so reasoned Fred Buck.

Accordingly he put up a lot of HONEY TONIC and put it on sale along with popcorn. He placed a basket with small change in it conveniently near, and left it for the purchaser to pay for the tonic and popcorn, making his own change.

Other tonic is sold, and whenever Peter and Teddy hear the clink of a bottle, they climb up the bars of their cage and tease and beg and cry till a bottle of their favorite brand is presented to them. Though Sundays, holidays and evenings, dozens of bottles are bought for the two bears, they never yet have had their fill. Bears have enormous appetites, and, judging from the HONEY TONIC Peter and Teddy Buck consume, there is no limit to their stomachs' capacity.

"Why," declared Fred Buck, "those bears make our patrons buy so much HONEY TONIC for them that the money that accumulates in the basket practically pays for their three meals a day."

Increasing the Yield With Hubam

By Paul W. Crabb.

When Peter C. Doke, now a successful beekeeper of northwest Arkansas, began his career in the bee business he found it hard sledding.

Then a fellow, whose grandfather had tried beekeeping in the Ozarks, and pronounced it a failure, came along.

"It's a failure, owing to the fact that there are few honey producing plants to be found," he declared.

But Mr. Doke is not the kind of fellow who quits a job after once starting it, and especially after spending so much money. Being tired of unreliable information, he consulted the County Agent.

"Try a few acres of Hubam," suggested the demonstrator. "You have ideal soil, seeing that it is of limestone formation."

The Hubam did the trick. Producing high-priced honey became a reality instead of a dream as in the past. Each season the acreage is increased. By giving the seed to farmers, and also scattering it along waterways and ditches, he finds it possible to increase his number of colonies.

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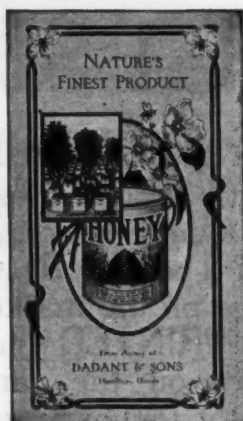
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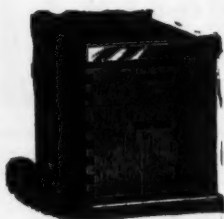
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BEESWAX AND PROPOLIS ✓

HERE has been published in European bee magazines quite a little discussion upon "Cire de Propolis," or literally, in English, "Wax of Propolis." It is found that propolis contains wax in quantity on the edges of the combs. It may not be amiss for us to republish part of Chapter VI of Huber upon the "completing of the cells." This chapter may be found beginning on page 252, Volume II of the French edition of 1814. The English translations do not contain it in full. I have both the 2nd edition of 1808 and the 3rd of 1821. The former has not a word of it; the latter contains a chapter with that title, but very much abridged.

Mr. Alin Caillais, in his article upon the subject, published in A. B. J., June, page 295, states that "no one has yet informed us how bees practice the operation of mixing beeswax with propolis. But in the notes that follow, it will be seen that Huber had noticed the use of propolis, not only about the walls and the entrance, but also on the combs. I have translated his entire work, "New Observations," but as paper and printing are very high now, we will wait to publish this book until easier times.—C. P. D.

THE COMPLETION OF THE CELLS

F. Huber, 1814, Chap. VI, Vol. 2.

Certain facts produce no longer upon us the impression of novelty; we see them without observing them, without trying to discover their causes and their aims; but can we foresee what will excite our curiosity? Is anything indifferent to the naturalist? If he avoids the unconcern which is the effect of habit, as well as the belief that all that deserves attention has been already observed, he soon finds interest in subjects that seemed to call for it the least.

In the midst of our researches we have often thought ourselves at the end of our labor; we perceived no more questions to solve, no more doubts to clear; but the bandage over our eyes fell of itself at last. A simple fact, seen every day without attention, would at last strike us, and we wondered why it should be less interesting than other peculiarities upon which we had spent much time. It was a new country open to us, and we were imperceptibly drawn into a new road, the existence of which we had not even suspected.

After several implements had given us the opportunity of studying the shaping of the combs and the modifications of the architecture of bees, we thought that new researches upon this subject would be useless; we were in error; the combs of bees are not completed when the sides and the bases of the cells are built.

In the origin the material of the cells is of dull white color, semi-

transparent, soft, smooth without gloss; but it loses most of these qualities in a few days, or rather it acquires new ones; a more or less distinct yellow tint spreads upon the interior of the cells; their edges become much thicker than they were at first, and appear less regular, and these shapes which did not appear able to resist the slightest pressure acquire a consistency of which they did not seem susceptible.

We noticed that finished combs were of greater weight, in equal quantity than those that were unfinished; the latter broke under the least touch, but the perfected combs bent instead of breaking; their orifices appeared sticky; the white cells could be melted in water at a lower temperature than the colored ones. All these observations indicated a noticeable difference in the composition of the combs and it was evident that those which were not new contained a material differing from beeswax.

In examining the orifices of the yellow cells, we perceived that their circumference was coated with a reddish, unctuous, odoriferous varnish, and we recognized, as we thought, the resin called **propolis**. Afterwards it appeared not to be restricted to the orifices, that reddish threads were sometimes found on their inner walls, upon the rhombs or trapezes; this solder, placed at the point of contact of the different pieces, and at the summit of their angles, appeared to help in strengthening the cells; one would sometimes notice one or two reddish zones around the axis of the longest cells; when the bees are short of wax, they are sometimes compelled to interrupt their work; when a more ample supply enables them to elaborate the material, they resume the work; it is probably during this interruption that they varnish the edges of the cells, and when the latter have been lengthened they retain traces of the material with which they had been coated.

These peculiarities had evidently not struck any of the naturalists who wrote upon bees; they knew that propolis was used to coat the inside of the hive; but they were not aware of this resin being used in the building of the cells; this was worth verifying. I made sure of it by comparative experiments, using the ordinary reagents.

The propolis taken from the walls of the hive and from the edges of red-colored cells, submitted to the action of ether, alcohol or oil of turpentine, imparted a golden color to these liquids. The brown matter of cells was dissolved by them, even when cold. The orifices of cells, in either alcohol or turpentine, retained the cell shape and their yellow tint after losing the varnish that coated them. Those placed in ether also lost the red varnish; they became

bleached shortly after and disappeared when the wax was dissolved.

The coloring matter of the cell orifices, exposed to a mild heat, became soft and could be drawn into threads; the propolis of the walls did likewise. Nitrous acid, at a low heat, poured on both, whitened the yellow wax in a few minutes, but the varnish of the orifices and the masses of propolis underwent no alterations.

Other orifices, put into boiling water, displayed a curious peculiarity; after the wax in them was melted, the varnish remained entire above it, on the cake which it formed, without losing its hexagonal contour, while its diameter seemed a little enlarged.

Fixed caustic alkali, which changes wax into a kind of soap, has no effect upon propolis; we tried its action upon very old cells which had already served as cradles to a number of larvae, the cocoons with which they were lined hiding the varnish and the wax upon which they had been moulded. The primary effect of the alkaline wash was to dissolve the wax by combining with it, separating it from the silky cocoons, which are naturally of brown color and gave them the appearance of gauze: they retained the shape of the cells; the reddish threads then appeared, for they were not dissolved, and remained upon the outer edges of the cocoons, just in the way that they had been placed by the bees in the furrows formed by the junction of the different pieces which composed the cells. These threads of propolis were finally separated from the cocoons, but they were not altered by remaining several months in the solution.

From these experiments it is evident that the substance which gives a dark red color to the edges of the cells and to the lines of intersection of their walls, has the greatest analogy to propolis; it is clear also that the yellow color of the cells has no relation to the varnish covering the joints of their different pieces.

Notwithstanding my confidence in such conclusions, I felt that they would be indisputable only after I had found the bees in the act. It was then necessary to follow them in their harvest of propolis and make sure of their use of it; but these researches were difficult.

Propolis has similar properties to those of gum-resin, since it has long been suspected of belonging to the vegetable kingdom. But for many years I fruitlessly endeavored to find the bees on trees producing an analogous substance; but none of my investigations directed me to those upon which the bees gathered this harvest, though we saw multitudes returning laden with it.

Being fatigued with the uselessness of my attempts I devised a very simple expedient, from which I could obtain some light. The question was to secure such plants as would be likely to supply propolis, and place them within their reach; this plan

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THE A. I. ROOT COMPANY OF IOWA, Council Bluffs, Iowa

succeeded; the first plants that I placed near my hives displayed to me in a short time that which I might never have found out, without this scheme.

In the beginning of July, some branches of the wild poplar, which had been cut since spring, before the growth of their leaves, with very large buds, coated both on the outside and inside with a viscous, reddish and odoriferous sap, were brought to me; I planted them in vessels before my hives, in the way of the bees going to the fields, so that they would be sure to notice them. In less than a quarter of an hour a bee took advantage of this chance; she alighted upon one of the branches, on one of the largest buds, separated its involucre with her teeth, pressing out its parts, drew out threads of the viscous matter; then taking with one of the legs of the second pair what she held in her jaws, she brought forward one of the posterior legs and placed into the pollen basket of this leg the little pellet of propolis that she had just gathered; this done, she opened the bud in another spot, removed more threads of the same material, took them with the legs of the second pair and gently laid them in the other basket. She then flew to the hive. In a few minutes a second bee alighted upon these same branches and loaded up propolis in the same manner.

We made the same experiment

upon recently cut poplar limbs, the young shoots of which were filled with propolis; they did not appear to attract the bees; but their sap was neither as thick nor as red as that which we had first offered to them, the buds of which had been preserved since spring.

Since the bees harvested this reddish and viscous substance from the buds of the common poplar, all that was needed was to identify this substance with propolis; no doubt of this remained after an experiment which we then made.

We took dry propolis from the walls of an old hive, we broke it up and soaked it in ether; this liquid assumed a yellow tint in each of nine consecutive experiments; but at the last it was very slightly colored; we evaporated it and there remained at the bottom of the vessel a residue of grayish white color. This residue, after having been steeped in distilled water, was examined with a microscope and distinctly showed vegetable debris, such as epidermis, portions of membrane, some opaque, others transparent, but no tracheæ.

Ether gave a similar reaction on poplar buds; it was colored with yellow several times over, and the residues, steeped in distilled water, showed through the microscope similar debris, but less thoroughly dissected than those found in propolis.

Thus the identity of the two substances was no longer in doubt and we had but to discover the manner

in which the bees applied it to use; we desired especially to witness the perfecting of the cells, but it was out of the question to see them work, without some lucky expedient. We hoped to follow them more easily in a hive where they would build their combs upwards, because in such a case some of the cells rest against the glass and their cavities are open for the eyes of the observer.

So we peopled a hive so prepared as to fulfill our views. The bees, building upwards, soon reached the glass, but unable to quit their habitation on account of supervening rains, they were three weeks without bringing home any propolis. Their combs remained perfectly white until the beginning of July, when the atmosphere became more favorable for our observations. Serene weather and a high temperature engaged them to forage, and they returned from the fields laden with this resinous gum resembling a transparent jelly, with the color and luster of the garnet; it was easily distinguished from the farinaceous pellets then brought home by other bees. The workers bearing propolis joined the clusters hanging from the ceiling of the hive; we saw them travel through the outside of these clusters; after reaching the supports of the combs, they appeared to rest; sometimes they stopped on the walls, waiting for their companions to relieve them of their burdens. We actually saw two

(Continued on page 488)

Crop and Market Report

Compiled by M. G. Dadant

For our October Crop and Market page we asked reporters to answer the following questions:

1. How big is the total 1924 extracted crop compared to 1923? Also comb?
2. Is the demand as good as a year ago?
3. What is being offered by buyers for comb and extracted?
4. Do you anticipate a change in prices from last year? If so, why?

THE CROP

Complete reports for the year are now beginning to come in and show considerable change over the prospects as given a month or two months ago. All reports would indicate that the total crop will be considerably less than has been expected, especially in the regions where the fall flow has been depended upon. This is on account of the fact that the weather has been very cool and unfavorable and the bees have missed good chances to store a big fall crop through an abundance of flora.

We give as follows the states which are reporting more honey than last year, together with the percentages compared to 1923:

Florida	125%	Iowa	125%
Ohio	140%	Kansas	200%
Missouri	125%	Louisiana	125%
Nebraska	150%	Illinois	110%
Georgia	140%	South Dakota	125%
Indiana	200%	Washington	125%

From this it can be seen that although there is considerable excess in some sections of the country it is mostly in sections which dispose largely of their honey without seeking the outside market. The big honey-producing areas are somewhat of a disappointment. This also applies to Texas, as it had been figured that Texas would have a much larger crop than a year ago. It appears now that the later flows have not materialized and the total crop will be very little in excess of 1923. In fact there will be no difficulty in disposing of the entire Texas crop locally, and prices are apt to begin rising very shortly.

In California our last report stated that the crop was somewhat in excess of 1923. We still believe that for the entire state the crop will be somewhat in excess of 1923, which our readers will recall was a flat failure. This is due to the fact that the Imperial Valley in southern California is doing considerably better than they did in 1923, whereas the central part of the state is, if anything, poorer than it was a year ago. Northern California will hardly have as big a crop.

Taking the whole country over, it is questionable whether the entire crop will be over 80 per cent to 85 per cent of what it was in 1923.

DEMAND FOR HONEY

Already everyone is noticing a quickening in demand for honey which is entirely out of proportion to the demand a year ago. In fact, honey was somewhat a drug on the market at this time last year, whereas now the honey is being demanded by consumers and the wholesalers being very well sold out make an especially good demand for the producer.

PRICE BEING OFFERED

Very few reports have come in as to the activity of buyers in getting honey of the new crop. In fact we learn of only one offer at 9c per pound, and two or three more at a price of 8½c a pound for extracted f. o. b. shipping point.

Practically all producers, however, are considering that the price will be somewhat in excess of 1923 and most of them are holding for a price which will net them at least 9c to 10c f. o. b. inter-mountain territory, which would be equal to 10c to 12c a pound in central western and eastern territory.

There is a decided determination on the part of reporters to maintain last year's prices in a retail way, but to stiffen on jobbing prices. The same holds true of comb honey, which is probably much less plentiful than a year ago, when there was a short crop. One of the largest handlers of honey in the west is asking a price of 9½ cents per pound for good extracted honey and \$5.00 per case for No. 1 comb. Our prices are not out of line at all, especially on the comb honey, when we consider the very short demand. It is extremely surprising, however, coming back to comb honey, that the central west and eastern beekeepers are asking such a low price, compared to the inter-mountain territory price. If inter-mountain territory can get a price of \$4.50 to \$5.00 per case, the central west and eastern beekeepers should add 25c to 50c at least per case to cover freight, drayage, etc. We find, however, that many reporters are selling just as cheaply as the inter-mountain people in carload lots.

WHAT WILL PRICES BE?

There is a growing sentiment towards an advance in honey prices as the season advances. It is our frank opinion that 1925 will see a much larger crop of honey throughout the country than 1924, so that it would be inadvisable to carry over any large quantity of honey. It is, however, certain that the crop is nothing like what has been expected and the industrial condition and prices of sugar do not seem to intimate that there should be any break in demand for honey during the fall and winter months. This being the case, we believe, personally, that honey prices should stiffen, in fact have already stiffened. Our advice to the buyer of honey would be that if he can purchase honey at a delivered price in the neighborhood of 11c per pound, it would be a good buy to purchase his requirements now. To the producer of honey who is willing to bide his time and does not necessarily have to sell his crop immediately, our advice would be that he hold for a price slightly in excess of a year ago.

SUMMARY

Most certainly it is very gratifying, indeed, to see that producers are "on the job" when it comes to knowledge as to the honey crop for this year and the possibility of securing a little better price for honey. We have had, however, one complaint from one or two sections of the country, and these were big producing centers, that the beekeepers had not kept themselves well informed on honey demand and honey supply and were selling their extracted honey in carload lots at a price from 1c to 3c under the market.

Naturally there is nothing that can be done to prevent this except education of the people, although perhaps there will be an awakening when they find that outside beekeepers have been getting a much better price.

Before closing we cannot refrain from stating that it is our opinion that unless comb honey prices stiffen there will be less and less comb honey produced from year to year. When a beekeeper can get in the neighborhood of 10c to 12c a pound for extracted honey it hardly seems warranted financially for him to produce honey in the comb at a price of 18c to 20c. The additional labor as well as the additional equipment and supplies necessary for selling this honey make it a losing proposition over extracted honey. There is no doubt but that the tendency is going to be toward extracted honey, as it is comparatively easy to get a demand for this honey when in oversupply rather than for the comb. Comb honey will always remain a luxury and as such, prices for it should rule firm on a basis which will yield a good round return on the investment.

We refer you for price suggestions to the table as given in the September number of the American Bee Journal:

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 15th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

As a measure of protection to our readers, we require references of all new advertisers. To save time, please send the name of your bank and other references with your copy.

BEES AND QUEENS

HONEY IN PAILS—

Atwater, Meridian, Idaho.

FOR SALE—Fine white sweet clover comb honey. Prices on request.

L. Madsen, Gardner, Ill.

FOR SALE—White clover honey in new 60-lb. cans, at 11c. Sample 20c.

Hoehn & Honigford, Ottoville, Ohio.

WARRANTED pure mated Italian queens by return mail at \$1.00 each, in my special introducing cage that never fails. I have a good supply of fine queens now, so I can fill orders promptly. No honey used in candy.

Daniel Danielson, Brush, Colo.

OWING to death in family, I am forced to sell 250 colonies of bees, supplies, equipment and city property; for full details address,

H. R. Fisher, Montrose, Colorado.

DEAR CUSTOMERS: Accept our sincere thanks for your patronage and hearty co-operation, which is more than appreciated. Satisfactory services guaranteed at all times.

W. C. Smith & Co., Calhoun, Ala.

I AM BOOKING orders for May delivery, from my best Caucasian or Italian race, 8-frame nuclei and queens. Apiary inspected.

Peter Schaffhauser, Havelock, N. Car.

FOR SALE—21 colonies in Massie hives and equipment, \$210.00; 19 colonies in 10-frame Langstroth hives and equipment, \$190.00. Guaranteed free from disease.

R. E. Cook, Renwick, Iowa.

WE are growing every year. 1925 is ahead. We wish to call the attention of those who wish to purchase bees, nucleus and queens for 1925 delivery. Our prices are very reasonable. We have the stock and man that knows how to ship bees. Write us your wants early. Do not wait until spring. We will gladly answer any question regarding the package business.

Central Louisiana Apiaries, Hamburg, La.

QUEEN BEES in season, \$1.00 each.

Graydon Bros., Rt. 4, Greenville, Ala.

BRIGHT Italian Queens for 1925.

J. F. Diemer, Liberty, Mo.

FOR SALE—58 colonies; 33 in Modified Dadant and 25 in 10-frame standard hives. Equipped with comb and extracting supers. Extractor, tank, cappings melter, etc. A good outfit to be sold at a bargain. No disease. Write for particulars.

L. C. Worth, Lilbourn, Mo.

IN CLOSING OUT my nuclei for the season I have some extra fine three-banded queens for 50 cents while the supply lasts.

Jasper Knight, Hayneville, Ala.

TESTED QUEENS—\$1.00 each, for the fall and winter months. Delivery guaranteed. Queens are mailed from my yards every month of the year.

D. W. Howell, Shellman, Ga.

PACKAGE BEES for 1925—Pure Italians. Write for descriptive price list.

J. J. Scott, Crowville, La.

FOR SALE—Fifty colonies Italian bees, free from disease. Also large lot of supplies. Write for list.

Geo. H. Frey, Gen. Deliv., Cedar Rapids, Iowa.

FOR SALE—200 colonies bees, mostly in 8-frame hives; plenty honey to winter; \$5 per hive, including 2 shallow extracting supers.

W. H. Henders, Dancy, Ala.

FOR SALE—Choice bright Italian queens.

I have been building up this strain for the last 20 years for vigorous hustlers, good winterers, gentleness and fine color. These queens will equal the best on the market. Health certificate goes with queens. Prices, untested queen, \$1.25; 12 untested queens, \$12.00; 1 breeder \$5.00.

Emil W. Gutekunst, Colden, N. Y.

FOR SALE—300 colonies of Italian bees in 10-frame Root hives in first-class condition, as they have been inspected by state inspector. Will not sell less than 100 colonies.

Earl L. Baker, Lake City, Mich.

FOR SALE—Young queen bees, 8-banded Italians, \$1.00 each.

Jager Apiaries, St. Bonifacius, Minn.

FOR SALE—100 colonies bees in 10-frame Jumbo hives, together with all equipment as extractor, supers, storage tanks, etc. No disease. Particulars if interested.

E. V. Tillson, Tillsonburg, Ontario.

ST. ROMAIN'S Quality Bees—I am offering for sale, three-banded Italian bees and queens at a very low price. I am booking orders now with 10 per cent with orders, balance twenty days before shipment. Spring delivery to be made April 15th to 20th, 1925, depending on weather condition. I also guarantee safe arrival and will pay transportation on any size order, from one package to a carload. Health certificate with each shipment. For prices and circulars write to John St. Romain, Marksville, Louisiana.

FOR SALE—200 colonies bees in healthy condition. Write for prices.

James Johnson, Pocahontas, Ark.

THREE-BAND Italian bees and queens. One selected tested queen, \$1.50; one selected untested queen, \$1.00; six or more, a liberal discount.

J. Allen, Catherine, Ala.

PURE ITALIAN QUEENS by return mail. Reared in natural honey flow, and strictly for business. The best are the cheapest. Let me prove it. July, August and September prices: 1, \$1.00; 6, \$5.00; 12 or more, 75c each. Most northern breeder in California.

J. E. Wing Chico, Calif.

"SHE-SUITS-ME" three-banded Italian queens, untested, \$1.00 each, after June 1; in May, \$2.00 each. If you wish 50 or more, write for price list. Tested queens, \$3.00. Nuclei and packages of highest quality at reasonable prices.

Allen Latham, Norwichtown, Conn.

CARNIOLAN QUEENS—Bred from imported mothers of pure Alpine stock. Lockhart's best select breeding strain in their support. No better combination could be arranged. Prices, 1 select untested, \$1.00; 6, 90c each; 12, 80c each, and 25 or more, 75c each. Circular free.

M. G. Ward, Lathrop, Calif.

BIG, bright Italian queens, 75c each, by return mail.

P. B. Skinner, Greenville, Ala.

SEE my display ad., page 478.

Jes Dalton, Bordelonville, La.

FOR SALE—Italian bees and queens. One-pound package with untested queen, \$2.50; 2-lb. package with untested queen, \$3.50. Queens, untested, up to May 15, \$1.00 each.

O. P. Hendrix & Son, West Point, Miss.

GOLDEN THREE-BANDED and Carniolan queens. Tested, \$1.00; untested, 75c each. Bees in 1-pound package, \$1.50; 2 pounds, \$2.50; 3 pounds, \$3.25. Safe delivery guaranteed.

C. B. Bankston, Box 65, Buffalo, Leon Co., Texas.

BRIGHT Three-band Italian Queens—\$1.00 each, 6 or more 75 cents. Two and three-frame nuclei.

Tupelo Apiaries, J. L. Morgan, Apalachicola, Fla.

BREEDER of fine Italian queens.

C. B. Saunders' Apiaries, Merom, Ind.

ITALIAN QUEENS of quality, \$1.00 each, \$11.00 for 12.

W. E. Buckner, Mt. Vernon, Ga.

FOR SALE—Three-band Italian queens, untested queens \$1.00 each; 6, \$5.50; 12, \$10.00. Tested queens, \$2.00 each.

Robert B. Spicer, Wharton, N. J.

MERRILL'S QUEENS—\$1.00 each.

R. E. Merrill, Muncy, Pa.

HARDY ITALIAN QUEENS—\$1.00 each.

W. G. Lauver, Middletown, Pa.

GOLDEN and three-band queens reared in separate yards; booking orders for 1924. Untested, one, \$1.25; doz., \$11.50. Safe arrival guaranteed in U. S. and Canada.

Tillery Bros., R. 5, Greenville, Ala.

FOR SALE

HONEY IN PAILS—

Atwater, Meridian, Idaho.

FOR SALE—Second-hand books on bee culture, all in perfect condition.

Mrs. H. B. Wright, Pocahontas, Va.

FOR SALE—5 acres of land, house and 70 colonies of bees in good shape; no disease. Good home market.

Mrs. H. T. Welton, Winslow, Ill.

PACIFIC NORTHWEST—2 2-10 acre home on the Columbia River in the fertile Yakima Valley under irrigation. Thirty colonies of bees with extracting equipment. Home completely furnished. Price \$3,500 includes cows, chickens, equipment. Everything ready for occupation.

Owner, Alf. Hansen, Richland, Wash.

FOR SALE—Good second-hand 60-lb cans, 2 cans to a case, boxed, at 60c per case, f. o. b. Cincinnati. Terms cash.

C. H. W. Weber & Co., 2163 Central Ave., Cincinnati, Ohio.

FOR SALE—120 acres irrigated unimproved land in Wyoming, \$30 per acre. Will grow 500 tons alfalfa per year. Easy terms. Would accept some bees in 10-frames or larger equipment on this.

Asher F. Dillard, Walthill, Neb.

FOR SALE—White and amber extracted honey. Write for prices. State quantity wanted.

Dadant & Sons, Hamilton, Illinois.

HONEY AND BEESWAX

HONEY IN PAILS—

Atwater, Meridian, Idaho.

FOR SALE—First quality basswood honey, 12½c per lb. in ton lots, F. O. B. Omaha.

Thos. Atkinson, Rt. 5, Omaha, Neb.

FOR SALE—Clover honey in any quantity.

Write. Roland Brandt, Postville, Iowa.

CLOVER and basswood blended by the bees, color and body fine. Prices upon request. State amount wanted.

W. A. Jenkins, Box 115, Rock Port, Mo.

FOR SALE—Honey in 60-lb cans; sweet clover, basswood, white clover, and other flavors. Tell us what you want. Beekeepers who need more honey for their trade and solicitors should write us.

A. I. Root Co.,

230 West Huron St., Chicago, Ill.

FOR SALE—Extra fine white clover extracted honey in new 60-pound cans, two in case, 11c per pound. Sample 20c.

Martin Carmoe, Ruthven, Iowa.

FOR SALE—100 cases fancy buckwheat comb honey, \$4.00 per case. Some No. 1 \$3.50 case. A few tons buckwheat extracted in 5-lb. pails and 60-lb. cans.

Silsbee Apiaries, Bath, N. Y.,

R. F. D. 1.

FOR SALE—Extra fine white clover honey in 60-lb cans, two in case. Prices on request. Sample 15c.

Alfred Stutt, Rt. 5, Creston, Iowa.

FOR SALE—Extra fancy white clover extracted honey, new cases, new crop. Write for prices.

Edw. A. Winkler, R. D. 1, Joliet, Ill.

FOR SALE—New crop comb honey, No. 1 white, \$5.50 per case; No. 2, \$4.50, six cases to carrier.

H. G. Quirin, Bellevue, Ohio.

FOR SALE—Fine quality of raspberry-milkweed honey in new 60-lb. cans.

P. W. Sowinski, Bellaire Mich.

FINE QUALITY clover honey. Prices upon request. State amount wanted.

C. S. Engle 1327 23rd St., Sioux City, Ia.

FOR SALE—White honey in 60-lb. cans; also Porto Rican in 50-gal. barrels. Samples and prices on request.

A. I. Root Co.,
16-18 Jay St, New York, N. Y.

FOR SALE—Comb and extracted white clover honey. Extracted in 60-lb. cans, 5 and 10-lb. pails. Prices given on request. Sample 15c. F. W. Summerfield, Waterville, Ohio.

BEE SWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire. Dadant & Sons, Hamilton, Ill.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request. Dadant & Sons, Hamilton, Ill.

HONEY FOR SALE in 60-lb. tins. White clover honey crystallized, 13c per pound. L. A. West Indian honey, liquid, 11c per pound. Hoffman & Hauck, Inc., Ozone Park, N. Y.

SUPPLIES

NEW 4-frame reversible extractor, 9% pockets, \$38.00. Lorenzo Clark, Winona, Minn.

FORTY-FIVE dovetailed 10-frame shallow extracting supers, nailed and painted three coats; never used. Thirty-nine have tin rabbets nailed in, six with all fittings for 4x5 sections. Sixteen good used 10-frame wire and wood queen excluders. One hundred corner-cut shallow extracting frames, nailed and wired, used one season. No disease in any of above supplies. Will take \$35.00 for the lot. Satisfaction guaranteed. O. S. Ward, Obion, Tenn.

DO NOT BUY your pails and cans for honey until you read my cut price circular. A. W. Smith, Birmingham, Mich.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list. American Bee Journal, Hamilton, Ill.

CONNECTICUT and Rhode Island headquarters for Root's Beekeepers' supplies. A. W. Yates, 3 Chapman St., Hartford, Conn.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list. The Colorado Honey Producers' Association, Denver, Colo.

MISCELLANEOUS

LADIES Work at Home—Pleasant, easy sewing on your machine; whole or part time. Highest possible prices paid. For full information address. L. Jones, Box 2, Olney, Ill.

"BEES AND HONEY," a bee paper edited by Geo. W. York; \$1.00 a year, or six months' trial for 30c. Sample free. "Bees and Honey" with American Bee Journal—both together for one year, \$2.00. Address York Honey and Bee Supply Co., Spokane, Wash.

WESTERN HONEY BEE, 428 S. Hewitt St., Los Angeles, Calif., published by Western beekeepers, where commercial honey production is farther advanced than in any other section of the world. \$1.00 per year. Send for sample copy.

GLEANINGS IN BEE CULTURE, published at Medina, Ohio, is the most carefully edited bee journal in the world. Its editor-in-chief is Geo. S. Demuth. Its field editor is E. R. Root. Ask for sample copy.

WE HAVE NOW ON HAND, from Paris, a number of copies of the excellent work of Perret-Maisonnette, in French, entitled "L'Apiculture intensive & L'Elevage des Reines." The first shipment was delayed over two months. The price of this very progressive work is \$1.50 by mail, prepaid. American Bee Journal, Hamilton, Ill.

THE BEE WORLD—The leading bee journal in Britain, and the only international bee review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a postcard today. It is well worth your little trouble.

THE "Archiv fur Bienenkunde" is a valuable scientific publication. "It merits the appreciation of all beekeepers acquainted with the German language," says the Bee World (January, 1923). "The Archiv fur Bienenkunde, now in its fifth volume, is of as high grade as any bee journal which comes from abroad, dealing especially with the scientific aspects of beekeeping," says Gleanings in Bee Culture (February, 1923). Annual subscription, \$2. Specimen copy free. Publisher, Theodor Fisher, Freiburg im Breisgau, Kirchstrasse 31, Germany.

THE DADANT SYSTEM IN ITALIAN—The "Dadant System of Beekeeping" is now published in Italian, "Il Sistema d'Apicoltura Dadant." Send orders to the American Bee Journal. Price \$1.00.

WANTED

HONEY IN PAILS—Atwater, Meridian, Idaho.

WANTED—Dark honey, well ripened, free from honeydew. Send sample; state quantity and price. John Auckland, Fairfield, Iowa.

WANTED—Second-handed reversible two-frame extractor. Harold Morey, Fairview, Brown Co., Kan.

WANTED—To buy amber and dark honey in 60-lb. tins. Name price and if interested will ask for sample. A. G. Woodman Co., Grand Rapids, Mich.

WANTED—Honey, comb and extracted, all grades. Write me. Geo. W. Dial, 3029 Stanley Ave., Detroit, Mich.

WANTED—Extracted white clover honey in carlots or less. Mail sample and quote best price. Roscoe F. Wixson, Dundee, N. Y.

WANTED—Car and less lots white honey, sections, bulk comb and extracted in sixties. L. D. Taylor, Chandler, Okla.

WANTED—To buy—Buckwheat honey. Thos. Cordner, Sparta, Wis.

WANTED—Comb honey. Quote price and quality on white clover and basswood variety. P. Outzen, Mahtomedi, Minn.

HONEY—State price and send sample. Paul Thomae, 1157 Third St., Milwaukee, Wis.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co., 204 Walnut St., Cincinnati, Ohio.

WANTED—Car or less lots of clover honey; mail sample and quote lowest cash price. A. W. Smith, Birmingham, Mich.

HONEY—Quote price car loads and less. Send sample. Hofmann Bros., Produce Co., St. Louis, Mo.

Two Men and Two Extractors

That is what C. P. Dadant writes from Georgetown, Ontario, about Morley Pettit: "Pettit is busy extracting honey. He has two large reversible extractors, both running, and two men uncapping."

That represents a truly fine business and we judge it results from a good man in a good location.

Georgia Beekeepers to Meet

The fifth annual meeting of the Georgia Beekeepers' Association will be held at Savannah on October 29

and 30. Secretary L. C. Walker has prepared an interesting program and those in attendance are promised two days of profitable discussion of beekeeping subjects.

Watch This Man

His name is R. B. Willson, Extension Specialist in Apiculture for New York State, with headquarters at Cornell. We are not going to give his Bertillon measurements, as they are not necessary. Just watch his smoke.

His latest is a demonstration car which is going about the Empire State, fully equipped to give demonstrations of the treatment of American foulbrood with Hutzelman's solution. Surely folks ought to know how to use it when he gets through.

You have read our opinion of extension men in the editorials. We want more like Willson.

Alabama Meeting

The Alabama Beekeepers' Association will hold the annual meeting Thursday, November 6, in the Chamber of Commerce Auditorium, Montgomery, Ala.

New Assistant Inspector in West Virginia

Hiram H. Bear, of Hinton, W. Va., has been appointed as Assistant Apiary Inspector. His chief, T. K. Massie, is now a candidate for the House of Representatives of the state and has a good chance of election. If so, West Virginia can look for legislation that will be beneficial to all the beekeepers in the state.

QUEENS MATE TWICE

By Theo. Gentz.

I read with interest your editorial entitled "How Many Matings for a Queen?" on page 326 of your July issue.

I have been raising queens for a number of years, but never gave this a thought, so tried a little experiment, after reading your article.

I had more queens hatched than I had room for in my mating hives, so placed fifteen of them in baby nuclei hives. Nine of these queens were mated when they were six days old. I then shut them up with queen excluders, until 2 o'clock the next day. I noticed some of the queens fly from the hives. At 3 o'clock I examined the hives and found five of the nine queens mated for the second time. One of these queens started to lay eggs after 26 hours, while the rest did not start until the second morning. Two days later I saw another queen mated for the second time. Seventeen hours later she had about 50 eggs in cells.

From this experiment I conclude that queens are usually mated twice. Wisconsin.

(Continued from page 484)

or three approach them and carry the propolis away with their teeth. The upper part of the hive exhibited the most animated spectacle, thither a host of bees resorted from all quarters, the distribution and application of the propolis being then their predominant occupation; some conveyed between their teeth the material which they had secured from the purveyors and deposited it upon the frames and the supports of the combs; others hastened to spread it out like varnish before it hardened, or formed it into strings proportioned to the interstices of the walls of the hive to be puttied up. Nothing could be more diversified than their operations; but we were most interested in the art which they used in applying propolis on the inside of the cells. Those which appeared to be charged with this task were easily distinguished from the multitude of workers because their heads were turned towards the horizontal pane of glass. Upon reaching it they deposited the propolis in the middle of the interval separating the combs. Then we saw them apply this substance in the real place of its destination: taking advantage of the points of support which its viscosity supplied, they appeared to hang to it with the claws of their posterior legs, seemingly swinging themselves under the pane of glass; the effect of this motion was to carry their body backward and forward and at each motion we saw the lump of propolis come nearer to the cells; the bees used their anterior legs to sweep together that which had been detached and to unite these fragments upon the surface of the glass; the latter recovered its transparency when all the propolis was brought to the mouth of the cells. A few bees entered the cells located against the glass; it was there that I expected to see them at leisure; they brought no propolis, but they cleaned and polished the cell with their teeth, worked in the angular corners, making them thicker, smoothed the rough edges; while the antennæ appeared to feel the way; these organs located in front of their jaws evidently enable them to notice such projecting molecules as must be removed.

After one of these workers had smoothed down the wax in the angle of a cell, she emerged from the cell backwards and having approached a heap of propolis, she drew out a thread of it with her teeth; this being broken off by a quick motion of the head, it was taken in the claws of the fore feet and the bee re-entered the cell which she had just prepared. She did not hesitate but immediately placed it in the angle of the two parts that she had just smoothed and probably found it too long for the space required for she cut away a piece of it; both of her front feet were used to stretch it and fit it between the two walls; and her teeth worked to imbed it in the angular furrow to be lined. After these divers operations

the thread of propolis evidently appeared too long for her taste; she raked it over with the same instruments and at each time removed a parcel of it; when the work was completed we admired the accuracy with which it was adjusted between the two walls of the cell. The worker did not stop there, turning to another part of the cell she worked with her legs upon the edges of the two other trapezes and we understood that she was preparing a spot to be covered with another thread of propolis. No doubt she was about to help herself out of the heap from which she had taken it previously; but contrary to our expectation she availed herself of the portion of the thread cut off from the first bit, arranged it in the appointed space and gave it all the solidity and finish of which it was susceptible. Other bees finished the work begun by this one, all the cell walls were soon encircled with threads of propolis, while some were also put on the orifices; but we could not seize the moment when they were varnished, though it may be easily conceived how it was done.

While these observations made known to us the art used by the bees in coating the walls of their cells, we had no explanation of the yellow coloring of their interior. In some of the chemical experiments already mentioned, the coloring pigment of the cells had not been acted upon in the same way as the propolis which coated them; since it appeared to have no analogy with it, it became necessary to ascertain the difference by additional experiments.

LEARN THE NECTAR SECRETING HABIT FIRST

By Dr. E. P. Stiles.

I am experimenting with bees in a territory of unknown advantages and disadvantages. I have made inquiry of Texas authorities on beekeeping, of practical beemen in the regions adjoining and of Tom, Dick and Harry to ascertain if Houston and its immediate environment were suitable for successful beekeeping. Not one has been able to give me information. There are probably not over six or eight persons in Houston and its adjoining suburbs who have any bees. This is a territory with a radius of five or six miles. I have met most of the persons who have bees, from one to five colonies, and examined their bees and have not found what I should call a really thrifty colony. One man living in the city, whom I have not been able to meet, seems to know that bees will not do well here. His son tells me that his father has 300 colonies, but his nearest yard is in another county. In 1912 a practical beekeeper, from Florida, I think, moved more than eighty colonies into the northwestern edge of the city. (I am in the southern edge, about eleven miles distant.) Within twelve months he had lost half of his colonies from starvation and moved the remainder away. Such information convinces me that the attempt to produce honey

in Houston would not be profitable. Yet it seems to me that there are flowers enough here to afford a fairly steady inflow of nectar during the year to support a few colonies in each of several yards, and that the scarcity of bees makes it a rather promising field for the production of purely mated Italian queens. Therefore, I am experimenting.

I have made a careful search about here for what are known to be nectar-producing plants. I find a rather satisfactory list of them within a radius of two miles of the location I have chosen for my apiary. I have been observing these plants during my residence of several years in Houston and have seen few or no bees upon them. This I attributed to the scarcity of bees. We have one plant in south Texas which is always visited by bees, if any are within hailing distance. The name of this plant is *Antigonon leptopus*. It has a number of common names. Here the more usual names are Queen's wreath or Mexican coral vine. Where bees are numerous the masses of flowers swarm with them. Occasionally I have seen this flower here without bees, never with many. Natural enough, since there are scarcely any bees within five miles of any plant. I argued with myself that, if there were no bees on coral vine, their absence from other flowers did not necessarily indicate that other flowers were nectarless.

I now have eighteen colonies here in my yard and am beginning to learn something about nectar yielding and non-yielding plants. Within a radius of a mile, these bees should show on all nectar-producing flowers.

We had a mild, wet winter and white clover has grown splendidly. It began blooming in December as usual, but full bloom did not occur until the second week in April. I have never seen so profuse a bloom in Texas. It is still (May 20) in full bloom. During this much of the period of its bloom, I have had to feed the bees several times to maintain rapid production of brood. My notes show that on the 18th and 19th of April bees were found working the white clover which surrounds the yard in all directions. These days were preceded by cold nights and the afternoons were hot. It was a cold snap following a heavy, warm rain a day or two before. The bees were not getting much nectar, even under these supposedly favorable conditions. They were not working eagerly or in such numbers as to attract attention. On May 14, I found bees working white clover again, not vigorously, however. During two days before, we had had considerable rain, and during all of May, so far, it has been colder than in April. I stopped to examine a plot of rank growing clover, but could discover no bees on it. A little further on I found bees working on the clover. Then I noticed what, according to my recollection, has always been the case, that the clover the bees were working was

dwarfed or stunted by close cropping by stock, in this case, by tramping or by the lawn mower in other cases. To make sure, I went back to the lush clover. Not a bee could be found. I gathered some of the heads. Then returning to the close cropped clover, I picked some of those heads, keeping them separate. At home, using a pair of drafting dividers, I compared the length of the tubes of the flowers of these two classes of plants. Having lost my metric scale, I could not make measurements, but I found that the tubes of the flowers from the stunted plants were about five-sixths of the length of those of the rank growing plants. Whether the tubes of the dwarfed flowers were generally short enough for the bees to reach the nectar, I cannot say positively, but I think they were. Neither do I know certainly whether the tubes of the lush flowers were too long for the tongues of the bees. It may be worthy of mention, in this connection, that our white clover is *Trifolium Carolinianum*, while that of the North, if I remember correctly, is *T. repens*. The bees are surrounded also by quantities of *Melilotus indica*. This is a yellow sweet clover but not the sweet clover, which is *M. officinalis*. I am not sure that *M. indica* produces nectar in quantity anywhere, though Richter lists it as a yielder of surplus in California, as quoted by Pellett. Here bees do not approach it.

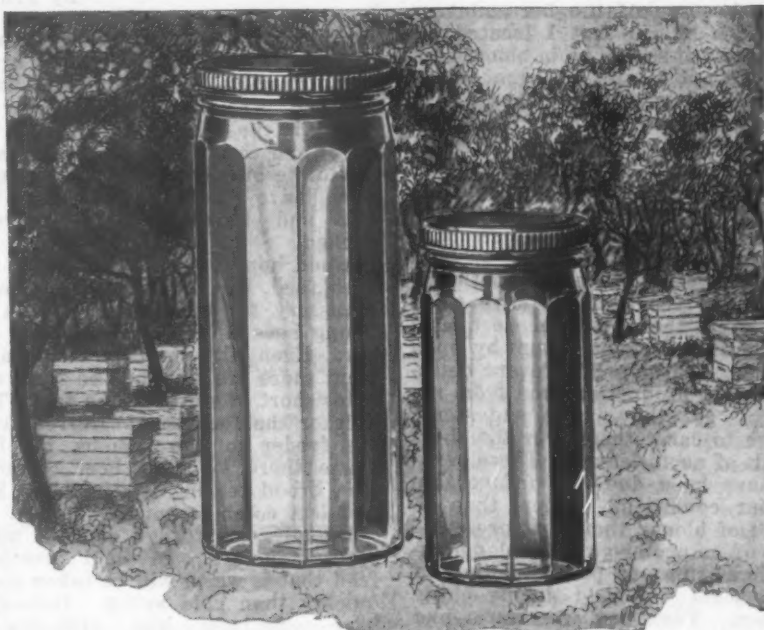
The California bur clover is said to yield nectar in California. It is my understanding that this is *Medicago denticulata*. It is abundant all about the bees here and abundant in many parts of Texas, but I have never seen a bee on it anywhere.

These clovers have been in constant bloom for weeks and the bees might have starved in spite of them.

Dandelion begins blooming here in December with white clover. It is very abundant on the lawns of the city and is usually allowed to grow for its pretty winter flowers. It has been past its full bloom for some time, but will continue in bloom for some time yet. I have sometimes seen bees gathering pollen from it. I don't think it yields nectar at all.

It is not yet time for the partridge or sensitive pea (*Chamaechrista* sp.) to bloom. Whether it will produce nectar in the Houston territory, I cannot say, but I have seen it among the bees in other parts of Texas and have never seen bees visiting it. We have in a county north of us another member of the senna family which produces nectar from glands on both flower and leaf. I have never classified this plant and do not know its common or botanical name. Like the partridge pea, its habitat is a sandy loam. I have seen it in Central Texas also.

The Yaupon, sometimes called here Cherokee tea (*Ilex vomitoria*) is reported as yielding nectar. While it is strictly at home here and has bloomed profusely this spring, the bees made no use of it, much to my disappointment, for it is abundant.



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W. D. ACHORD, Fitzpatrick, Alabama

I am beginning to feel some doubt if horsemint, the Texas standby, will yield nectar in this locality. It was partly because of the horsemint on two sides of me that I located my bees here. It should be in bloom now, but I do not see its mark on any of the bees. I have just looked for it, though they are bringing in nectar from some source today.

However, since the bees arrived here, the last of March, they have managed to find ample nectar for the production of quantities of bees until May first. Since then the weather has been very unfavorable both for nectar and for bees. I have tided them over these several nectarless periods during clover bloom by open feeding. Fed more to prevent cessation of egg production than from necessity, as they have had stores enough to carry them over the short periods of nectarlessness. These periods have been due to unfavorable weather conditions rather than to failure of bloom, though at present I know of no nectar-yielding bloom except *ligustrum* and privet, neither of which seem to yield during chilly weather. Yesterday was warm and so is today, and both days the bees have been bringing in some honey.

Willow was going out when the bees arrived in a poverty-stricken condition, but I think it was willow which supplied them for their first two weeks residence. Blackberry, dewberry and vetch were in bloom at the same time. I found the bees working all, though not actively on vetch. Later prickly ash furnished some nectar and, perhaps, the magnolia also. The bees flew across the bayou towards the magnolia timber for some time, though I did not have an opportunity to observe them working on it. I think more likely it was persimmon bloom attracting them. Persimmon yields abundantly here for a short time. It is regrettable that the blooming period is so short.

Still later the bees have been engaged with *Ligustrum* and the hedge privets, when the weather favored secretion in their flowers. I believe these shrubs are not listed among honey plants. Both are profuse bloomers and yield some nectar, how much or little I cannot say. I have seen bees working *Ligustrum* in Central Texas, also.

Texas.

He Likes Caucasians

My average from the Caucasians was 150 pounds and from the Italians only 25 pounds. The Caucasians were ready for the honeyflow the last of April, while the Italians were later. Here the honeyflow comes early in spring. I must have my colonies ready for it. If I miss it then all my work is in vain. The Caucasians have delivered the goods for me so far. I have been asked if the Caucasians daub up everything. I have to admit that they do close up every crack and build breastworks at the entrance, but the brood combs are free.

Peter Schaffhauser,
North Carolina.

THE FEEDING OF BEES

By Frank Van Haltern.

BEES are fed to prevent starvation and to stimulate brood rearing. The best of all ways to feed bees is to leave plenty of honey in the hive when removing the crop, and the best of all methods to stimulate brood rearing in the spring is to leave plenty of stores in the fall and have the bees warmly packed.

Good honey is, without doubt, the best feed, as it contains elements necessary for the proper growth of young bees which are lacking in sugar. Even with the best of management there are bound to be some colonies short of stores in the fall. The quicker the feed is transferred from the feeder to the combs the less waste there is. The bees consume less, brood rearing is stimulated less and less comb is built.

Rapidity of storage depends upon several factors. In cool weather, feed that is warm will be taken more quickly than cold syrup. Indeed, I have sometimes had difficulty to make bees clean up cold, stiff honey from the inner cover. It is not only the warmth of the feed but syrup or honey that is warm has a stronger odor than when cold, and thus attracts the bees. Cold honey is so stiff that, mechanically speaking, it is difficult for the bees to handle it.

A strong colony will store from the feeder more quickly than a medium or weak colony, not only because of the greater number of bees but also because it has more heat which tends to keep up the temperature of the syrup.

Honey will be taken more quickly than sugar syrup because it has a stronger odor. This is why it is preferable to feed sugar during robbing time. I have found that a little honey mixed in the sugar syrup seems to stimulate the storage of the syrup.

Another important factor is the distance of the feeder from the cluster. This is more important in cold than in warm weather. One fall I had a colony to which I gave 15 pounds of honey in a box feeder above the inner cover and inside an empty super. The bees had to travel 12 or 14 inches to get to the honey. In a week's time they had

scarcely touched it, as the weather was cool. I then poured the honey into two syrup pails with holes in the lids and inverted them directly on the top bars of the frames. Two days later the honey was all taken. This is wherein the entrance feeder often fails, as it is outside, exposed to the cool nights, and on cold days the bee does not care to go so far from its warm cluster and fill up with cold syrup.

During the warm days of late August and early September, almost any kind of sweet will be quickly taken by the bees. As the days get colder there comes a time when they refuse to leave the cluster, and the feed is untouched unless it is brought in contact with the cluster and covered so that the heat of the cluster keeps the chill off the syrup.

In my opinion, the best time to feed for winter stores is about the time of the first killing frost, or sooner if there is much feeding to do. If the syrup is fed warm, close to the cluster, either early in the cool morning before the bees are astir or late in the afternoon, and care is taken not to spill the syrup, there will be little trouble with robbers and the feed will be taken with maximum speed. For the beginner evening feeding is safest.

I have done very little stimulative feeding. One spring we filled a batch of brood combs with a mixture of honey and sugar syrup made rather thin. It was sprinkled into the cells of the combs with a can that had the lid punched full of holes. These we hauled out just before dark and put one or two in each hive. Examined several days later, the colonies that were fed had more young brood and were much more active than those not fed. However, stimulative feeding is so uncertain in its results and is so expensive in feed and labor and the risk of robbing that I do not believe it is profitable except for special purposes.

Since a weak colony will take feed more slowly than a strong one it is more likely to be stimulated to brood rearing when fed for winter stores, as the supply in the feeder lasts longer. I have had fed colonies show a frame of brood with eggs as late as

Col. No.	Duration of feeding	Approx. lbs. fed	Size at start	Size at finish	Approx. stores in hive at finish
26	25 days	35	2 brood	full col.	40 lbs.
53	39 days	40	2 brood	½ col.	35 lbs.
64	42 days	40	2 brood	full col.	35 lbs.
4	24 days	50	2 brood	½ col.	35 lbs.
8	28 days	40	1 brood	3 brood	30 lbs.
11	24 days	30	1 brood	2 brood	10 lbs.
12	19 days	25	1 brood	2 brood	25 lbs.
13	19 days	30	2 brood	½ col.	30 lbs.
14	25 days	25	2 brood	2 brood	15 lbs.
15	23 days	20	1 brood	1 brood	10 lbs.
10	19 days	30	½ brood	2 brood	25 lbs.
9	21 days	25	¾ brood	2 brood	25 lbs.

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the middle of November, in north-east Kansas.

The summer of 1923 I tried to stimulate some nuclei into becoming full colonies by feeding. It was the nature of an experiment and also to use up a quantity of honey I had on hand that was mixed about half with honeydew. The honey was not diluted with water, as then it soured too quickly and, besides, I wanted to get some stores in the hives for winter.

The period of feeding covered nearly all of August. There was barely enough honey flow to support other colonies without using their stores. The table here given will show what success—or failure—I had. The figures are estimated only, not exact weights. The average number of pounds fed was 32, while the average stores in the hives at the end of feeding was 26 lbs. each. Only a part of the colonies were strong enough in bees and stores to winter, so I doubled most of them with other colonies. At 8 cents a pound for the feed, they cost me \$2.56 each. If doubled to proper strength the cost would be around \$5.00 each, exclusive of labor.

I had long had a desire to make increase near the end of the honey flow when there would be plenty of bees, stimulate them a little and have colonies ready for winter by frost. It looked fine. The results of this trial, however, cured me.

Iowa

THOSE BEE DANCES

By LeRoy Davis.

There is so much written about bees dancing, that one might wonder to what extent this immoral practice will lead. And we sincerely hope our bees will not waste their time nor neglect their duties in such frivolity. Nor would we be surprised to hear that the black drones are at the bottom of it.

I might be able to give some light on the subject of dancing, as I was raised among Southern negroes, who hold the record of dancing. But Mr. Lovell describes two entirely different dances in the American Bee Journal. One described it as giving the intelligence of newly found nectar; and the other as communicating the discovery of newly found pollen. And it is a notable fact that a negro dances only when his stomach is full.

I had always believed that those spasmodic actions were spontaneous productions of the mood, and that all such dances were actuated by the same impulse. So a bee might dance with propriety on a full stomach, but with legs shackled with pollen, on account of the inconvenience, to say nothing of appearance, would decline to do more than a wag-tail performance.

Texas.

CHICKENS AND BEES

By L. H. Cobb.

I have kept bees in the poultry yard when it was also the orchard, and have had a little trouble with the young pullets taking to bee eating. I have never moved a hive because of it nor killed a chicken, but I have set the hive up a foot off the ground, and that was effectual, even when the habit had been formed to some extent. It was amusing to watch the pullet getting her meal. She wanted bees, but not stings, and she would slip up slowly and carefully, remain perfectly still for a moment or so until a bee was located just right, grab it and step back quickly, and even then she had to shake her head pretty fast to keep from being stung many times. I helped it along by taking a long fishpole, fastening a cloth to the

tip, placing it in the entrance and holding the outer end when I saw she was hunting bees. When she poised for a catch I stirred the bees up by twisting the cloth on the end of the fishpole, bringing out a bunch of angry stingers ready for business, and the pullet would be too slow to get out of range. I do not think they managed to sting her much, but she had a merry race through the shrubbery to get rid of them. I never saw an old hen or a rooster eat bees, and I have had them pass all around the hives with no trouble from stings and never pay any more attention to the bees than bees paid to them. I know of no better place for bees than in a chicken yard where trees are growing, for the poultry keeps down the weeds, and the shade of the trees, with good air movement from clean

ground, will make for better honey production and less swarming.

DRONE-LAYING WORKERS

There are a few persons yet who deny the existence of drone-laying worker bees. Concerning that subject, we happened to find, this morning, while reading old magazines, a short article by Paul L. Viallon, in the American Bee Journal for July 12, 1882, which coincides with our own experience. The letter was addressed to Professor Cook. Here it is:

"Yesterday evening, I was examining a nucleus containing fertile workers, and while holding the comb in my hands, looking at several workers laying, they all at once flew off, and after flying several minutes in the air, they settled on a plum tree close by. In fear that they would not return, I took the same comb and hung it against the cluster. I had hardly done that when they all ran on the comb and the fertile workers went to laying in a few moments. I counted as many as 15 laying at the same time, and others performing the same operation in their turn. After catching 8 or 10 and pressing their abdomens, I had 4 to show the egg, and in fear of losing the opportunity I sent one of my assistants to the drug store for a vial of alcohol. (Viallon was a druggist). I caught several in the act of laying, put them in the alcohol and send them to you by mail. This is almost incredible. My opinion is that every bee in that nucleus is capable of laying. I ought to mention that there is but about half a pint of bees in that nucleus."

Professor Cook made the following comment:

"The above is very interesting. The bees were in no way peculiar, except that some of them had very large but rather short abdomens. I dissected six of them. In all I find eggs. The ovaries, instead of being multitubular as in normal queens, have only two or three tubes, and the eggs, instead of being indefinite in number, are so few that it would be an easy matter to count them. There was no sign of spermatheca, and the poison sack was large, as in workers and not as in queens."—C. P. D.

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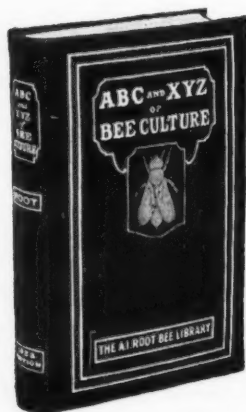
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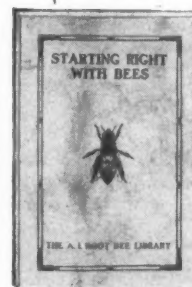
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